HEADQUARTERS
UNITED STATES ARMY MATERIEL COMMAND
WASHINGTON, D.C. 20315

AMC REGULATION
NUMBER 715-505, Volume 3
CHANGE 2

19 February 1965

PROCUREMENT

AMMUNITION BALLISTIC ACCEPTANCE TEST METHODS
TEST PROCEDURES FOR 7.62-MM CARTRIDGES

AMCR 715-505, Volume 3, February 1964, is changed as follows:

a. Remove pages and insert new pages as indicated below.

Remove pages--	Insert pages--
i through v	i through viii
Chapter 1	
1-1	1-1 through 1-7
2-1 through 2-18	2-1 through 2-19
6-2	6-2
7-1 through 7-5	7-1 through 7-7
19-3	19-3
20-1 through 20-5	None
A-1	None
Chapter 4	
None	i
None	1-1 through 1-63

b. Make the following pen-and-ink changes:

(1) Chapter 1.

(a) Change page numbers 2-19 and 2-20 to 2-20 and 2-21 respectively, and page numbers 7-6 and 7-7 to 7-8 and 7-9 respectively.

(b) Change the following paragraphs to: "Equipment listed in the [1] _____ section of the appropriate Inspection Equipment List shall be used."

[1] Insert the appropriate section title in the blank space.

Page	Paragraph	Page	Paragraph	Page	Paragraph
3-1	3.2.1	9-1	9.2.1	14-1	14.2.1
4-1	4.2.1	10-1	10.2.1	15-1	15.2.1
5-1	5.2.1	11-1	11.2	16-1	16.2.1
6-1	6.2.1	12-1	12.2.1	18-1	18.2.1
8-1	8.2.1	13-1	13.2.1		

(c) Change the following paragraphs to: "The pier or mount on which the test fixture assembly is mounted shall be of solid construction."

Page	Paragraph
12-1	12.2.3
13-1	13.2.3
18-1	18.2.3

(d) In the following paragraphs, change "±2500 PSI" to "±2000 PSI".

Page	Paragraph
13-1	13.3.3, line 2
13-4	13.5.2, line 1

(e) Page 19-1, paragraph 19.2. Change to: "Equipment shall be the equivalent of that listed in the Waterproof section of the appropriate Inspection Equipment List."

(f) Page 20-6. Delete paragraph 20.6.5 and the page number.

(2) Chapter 2. Change the following paragraphs to: "Equipment listed in the [1] _____ section of the appropriate Inspection Equipment List shall be used."

[1]Insert appropriate section title in the blank space.

Page	Paragraph	Page	Paragraph
1-1	1.2.1	4-1	4.2
2-1	2.2.1	5-1	5.2.1
3-1	3.2.1	6-1	6.2.1

(3) Chapter 3. Page 1-1, paragraph 1.2.1. Change to: "Equipment ted in the Velocity section of the appropriate Inspection Equipment List ll be used."

(4) On all "report forms" throughout the regulation, change "Sample" "Suggested Format".

(AMCQA)

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CONTENTS

*This regulation supersedes Part III, ORDM

INTRODUCTION

PURPOSE

The purpose of this regulation is to prescribe uniform proof and inspection procedures to be used by all proof-testing facilities for acceptance of small arms ammunition. Adherence to these procedures, and equipment listed in the Inspection Equipment List, is considered necessary to assure uniformity of test results; however, in the event conflicts are encountered between the provisions of this regulation and the Item Specification, the latter shall apply.

NUMBERING SYSTEM

Each chapter carries its own independent sequence of section numbers; each section carries its own independent sequence of page and paragraph numbers. Pages are numbered as follows: the figure preceding the dash represents the number of the section and the number following the dash denotes the page within the section. Thus, page 2-4 means section 2, page 4. Paragraphs are numbered so that the first figure represents the number of the section, the figures following the decimal denote the number of the paragraph. For example, 2.1 means section 2, paragraph 1.

INSPECTION EQUIPMENT LIST

Inspection Equipment Lists contain a complete list of the equipment, together with the drawing numbers of the equipment that shall be used for the individual tests. Each specification identifies the appropriate Inspection Equipment List.

RECORDING OF DATA

The suggested formats contained at the end of each test procedure are advisory only and may be used for all applicable tests. The data recorded shall be as prescribed by the various sections of this regulation and as prescribed by the Item Specification.

SAFETY

It must be recognized and emphasized that all proof-testing is hazardous. During the conduct of any test or operation described in this regulation, all local installation safety precautions and rules shall be observed. In addition, strict observance shall be made of the regulations as set forth in the AMC Safety Manual, AMCR 385-224.

REVISIONS

As new equipment is adopted for official use and as changes in proof-testing techniques are authorized, revisions and amendments to this regulation will be made to reflect such changes.

All communications concerning volume 3 should be addressed to:

Commanding Officer
U. S. Army Frankford Arsenal
ATTN: SMUFA-Q3000, Ammo Engr Div, QAD
Philadelphia, Pa. 19137

CHAPTER 1

BULLET TYPE CARTRIDGES

SECTION 1

WEAPON UNIT GUIDE

1.1 PURPOSE

The inspection, maintenance, and cleaning of ballistic equipment is an important part of proof technique. Weapons used for official acceptance tests shall be inspected, maintained, and cleaned in accordance with the practices outlined herein. Complete records of the wear history of weapons should be maintained for reference as a possible aid in the interpretation of ballistic results. All weapons are controlled by regular inspection and maintenance.

1.2 EQUIPMENT

Equipment listed in the applicable Inspection Equipment List shall be used.

1.3 FIRING-PIN MEASUREMENTS

1.3.1 Before comparability in test conditions can be established between stations, it is necessary that attention be paid to firing-pin diameter and contour, firing-pin protrusion, and firing pin indent of the test weapons and Universal Receivers. These measurements shall be made before a weapon or receiver is placed in service; after misfires, pierced primers, or flowbacks; or whenever a part replacement has been made in the bolt assembly.

1.3.1.1 Firing-pin diameter shall be checked with a micrometer; however, when difficulty is experienced with an unusual series of primer defects, the contour of the firing-pin point should be checked with a templet or visual comparator. The diameter of the firing-pin hole in the face plate should be checked concurrently. A loose fit between firing-pin and firing-pin hole, due to improper diameter of either or both, may cause punchouts of the primer and loss of sensitivity due to eccentric blow.

1.3.1.2 Firing-pin protrusion must be checked frequently to insure against pierced primers or misfires. Pin protrusion is measured with a dial gage of such construction as to be suitable for the particular weapon or receiver involved.

1.3.1.3 Firing-pin indent shall be measured by placing a copper pressure cylinder in a fixture (drawings of cylinder and fixture are referenced in the applicable Inspection Equipment List). The fixture is then inserted in the chamber of the weapon, the bolt is closed, and the

firing-pin released. The cylinder is then removed and the distance from the bottom of the indent to the undeformed surface of the cylinder is measured using a dial gage. A point micrometer graduated to .0001", may also be used. If a micrometer is used, the cylinder shall be measured before indentation is made, and again after indentation between the bottom of the indent and the opposite end of the cylinder. This measurement is subtracted from the original measurement; the difference shall be the primer indent.

(NOTE: Firing-pin indent and firing-pin protrusion shall be as shown in the detailed sections of this Chapter.)

1.4 MEASUREMENT OF GUN CHARACTERISTICS

1.4.1 Headspace. The headspace of all test and service weapons shall be measured the first time they are put in use during any shift or when fitting new barrels to fixed receivers. All test and service weapons shall conform to the headspace tolerance specified in the detailed sections of this manual.

1.4.2 The headspace measurement for weapons containing the M1903 receiver is made as follows:

1.4.2.1 The bolt is stripped so that the operator will not be deceived by the drag caused by the extractor or other parts. A headspace gage is then selected by trial and error, which, when inserted into the chamber like a cartridge, will just allow the bolt to close when moderate pressure is applied. The dimension of this gage is the value of the headspace of the weapon. This measurement is checked by removing the headspace gage just described from the chamber, and inserting the next larger gage (plus .001"), which should stop the bolt before it is completely closed.

1.4.2.2 Corrections to headspace shall be made by the gunsmith only

ents of headspace of barrels assembled to Universal
as follows:

1-block is closed on the empty chamber and the
carefully noted. Complete closure is deter-
breech elevating mechanism as it snaps into
mark upon the receiver housing may be found
.e. The headspace gage is then selected by
.en inserted into the chamber like a cartridge,
ch-block to close to the position noted above.

The dimension of this gage is the value of the headspace for the assembly. The measurement is checked by removing this headspace gage and inserting the next larger gage (plus .001"), which should prevent the breech-block from completely closing.

1.4.3.2 Barrels are adjusted for headspace when adapted to the Universal Receiver by fitting them to a Master Receiver and adjusting the headspace of each barrel to the same Master. Then, when put into service only minor adjustments are necessary with any Universal Receiver and the adjustment becomes a receiver adjustment instead of a barrel adjustment. Once made, no further adjustment in receiver should be necessary unless conditions change radically or unless barrel adaptations are made in a careless manner.

1.4.3.3 Corrections to headspace shall be made by gunsmith only.

1.4.4 Measurement of headspace in automatic and semi-automatic rifles is made as follows:

1.4.4.1 The weapon is disassembled sufficiently to permit removal of the operating spring, and in the automatic rifle, the firing-pin and extractor.

1.4.4.2 The weapon is then reassembled, and the bolt gently closed by manual pressure on the operating rod or slide. Position of the bolt and associated parts is noted. A headspace gage is selected by trial and error, which will permit closure of the bolt and associated parts to the position noted. As a check of the measurement, the gage is replaced with a gage .001 inch longer. The bolt should not close fully upon this gage.

1.4.4.3 When checking the headspace of a mounted weapon (except automatic rifles) the operating spring need not be removed. Instead, the gage may be fitted to the bolt and fed slowly into the chamber. The measurement obtained by this method will sometimes differ from that obtained by the method given but should be sufficiently close to afford a good check.

1.4.5 Measurement of headspace in machine guns with adjustable headspace is made as follows:

1.4.5.1 Prior to the initial headspace determination of an assembly, the weapon is adjusted as indicated below:

1.4.5.1.1 The weapon is completely assembled ready for firing, except that the barrel is screwed into the barrel extension a sufficient distance to prevent the bolt and barrel extension from moving completely

into battery. The barrel is then unscrewed one notch at a time, until the bolt and barrel extension will move smoothly into battery with a solid metallic sound when slowly eased forward from a position one inch out of battery. When this adjustment has been achieved, the barrel is unscrewed one additional notch.

1.4.5.1.2 The gun is then headspaced as directed hereafter and the position of the barrel is marked for quick adjustment in future assembly by a peen mark opposite the proper marked notch. Once this adjustment is properly made for a given barrel, it need not be repeated. Instead, the barrel is, on assembly, screwed fully into the barrel extension and then backed off (unscrewed) until the locking spring engages the proper marked notch. The bolt is then functioned by hand two or three times to test the adjustment. Starting from battery position, the bolt is moved slightly to the rear by hand. If the adjustment has been properly made, there will be no movement of the bolt independent of the barrel extension.

1.4.5.2 To measure headspace the gun is assembled as for firing, except that the driving spring and back plate are left off. The gage is inserted into the feedway, and aided by the thumb and index finger of the left hand, is fed into the chamber and seated gently by closing the action easily. If the bolt fails to close completely, the gage is too large. The next smaller gage is tried, and this is repeated until the headspace gage just allows the bolt to close completely. The dimension of this gage is taken as the headspace of the weapon.

1.4.6 Measurement of headspace in machine guns with fixed headspace is made as follows:

1.4.6.1 Headspace for these weapons shall be predetermined by the gun manufacturer and shall not be adjusted or altered by the testing facilities.

1.4.6.1.1 The procedure prescribed in 1.4.5.2 shall be followed when measuring headspace of these weapons.

1.5 CARE AND MAINTENANCE OF WEAPONS

Proper cleaning and lubricating of all ballistic equipment is essential for accurate reproducible proof results.

1.5.1 The bore of the weapon is cleaned as follows:

1.5.1.1 A soft bristle brush is saturated with cleaner and worked through the barrel with a vigorous scrubbing action. A brass brush is then run completely through the barrel in one long continuous stroke.

When the brush emerges from the opposite end of the barrel the stroke is reversed and the brush is withdrawn through the barrel.

1.5.1.2 The bore is again swabbed with a soft bristle brush soaked in solvent. A cloth patch soaked in solvent is run through the bore several times. The chamber is carefully wiped with a similar patch.

1.5.1.3 A succession of clean cloth patches is then run through the bore until it is completely dry and clean. If barrel is not to be used in the immediate future, a clean patch is immersed in oil and run through the barrel so that a light film covers the chamber and bore.

1.5.2 The gas cylinders of gas-operated guns are cleaned in the same manner as is the bore.

1.5.3 Small metal parts are cleaned by immersing in a bath of solvent or cleaner and scrubbing vigorously with a brass brush. Large metal parts are cleaned by wiping with a cloth soaked in solvent, cleaner or light oil.

1.5.4 Frequency of lubricating and cleaning.

1.5.4.1 Special test weapons (Universal Receivers, Pressure Gages, Accuracy Rifles, etc.).

1.5.4.1.1 The bore and chamber are cleaned and lightly oiled at the close of each shift in which the weapon is used. All exposed parts of the receiver are wiped with an oily cloth.

1.5.4.1.2 Once each week, each Universal Receiver in current use, is completely dismantled, inspected, cleaned, and lubricated.

1.5.4.1.3 Metal fouling is removed when it becomes too thick. The time for removal of such fouling is left to the judgment of the gunsmith, but the barrel is never allowed to foul to the point where the fouling begins to scale off.

1.5.4.2 Service Weapons

1.5.4.2.1 The chamber and bore are cleaned at the close of firing on each shift in which the weapon is used.

1.5.4.2.2 The receiver and bolt groups of each weapon are completely disassembled and cleaned at the close of firing on each shift or after 1,000 cartridges have been fired, if more than 1,000 cartridges be fired per shift. The hammer and trigger groups of automatic and semi-automatic rifles are completely disassembled and cleaned as needed.

Complete disassembly of the trigger and hammer group each day is unnecessary. Carbon is removed from the gas cylinder and piston of gas-operated weapons whenever necessary. The interval of such cleaning varies from 500 to 5,000 cartridges depending upon the weapon.

1.5.4.2.3 The weapon is lubricated after each cleaning. Lubrication is applied to all moving parts and to the bore.

1.5.5 Inspection of Weapons

1.5.5.1 All of the items listed are checked in the initial inspection of the gun; items marked (*) are checked daily; and items marked (**) are checked weekly when a weapon is used frequently or continuously. Items to be checked when a weapon is inspected are listed as follows for manually operated rifles. Universal Receivers and assemblies containing the M1903 Receiver:

a. Unpack, remove rust preventive.
* b. Disassemble, clean, and lubricate.
* c. Inspect chamber and bore.
d. Check headspace.
e. Check bullet seat (breechbore gage).
f. Examine locking and camming mechanisms.
g. Examine striker and bolt.
**h. Check firing-pin protrusion.
**i. Check firing-pin indent.
* j. Hand function, check smoothness of feeding and ejection.
k. Check bolt-lift of rifles.

1.5.5.2 Automatic and semi-automatic

a. Unpack, remove rust preventive.
* b. Disassemble, clean, and lubricate.
* c. Inspect chamber and bore.
d. Examine striker, bolt, and hammer.
**e. Check firing-pin protrusion
f. Check function of operating rod, bolt, camming mechanism, and bolt linkage.
* g. Check headspace.
**h. Check firing-pin indent.
i. Function with full clip of dummy ammunition.

1.5.5.3 Machine Guns

a. Unpack, remove rust preventive.
* b. Disassemble, clean and lubricate.
* c. Inspect chamber and bore.
* d. Examine bolt group.

* e. Examine barrel extension and buffer groups.
* f. Examine receiver.
**g. Check firing-pin protrusion.
* h. Check headspace.
**i. Check firing-pin indent.
j. Check function with belted dummy ammunition.

1.6 REMOVAL OF METAL FOULING

1.6.1 The solution used for the removal of metal fouling consists of the following:

Ammonium persulphate, USP ----------	1 oz.
Ammonium carbonate, USP ----------	0.5 oz.
Ammonia water (28% NH3 oz. vol.) Spec. O-A-451, Class B ----------	6 oz.
Water ----------	4 oz.

It is recommended that this solution be prepared as required and should be discarded after it is one month old.

NOTE: This solution is very corrosive when allowed to dry on a metal surface or if brought in contact with a hot surface of a barrel. Great care should be exercised to see that it does not come in contact with blued metal or with gun actions.

1.6.2 To remove metal fouling, the barrel should be thoroughly cleaned. To remove the last traces of oil, a single cartridge should be fired through it just before introduction of the fouling solution.

1.6.3 A tight fitting stopper is inserted into the bullet seat, and the fouling solution poured into the barrel until it is filled completely up to the muzzle.

1.6.4 If the solution does not completely fill the barrel, a line of corrosion will be formed. Some method must therefore be used to assure the barrel remains completely full. (A rubber tube slipped over the muzzle, a crater of grease built up around the muzzle, or the constant observation and addition of solution as it evaporates.)

1.6.5 After one-half hour, the solution is poured out and the color noted. If the color is a deep blue, the treatment must be repeated. Between each application and after the final one (when the solution shows only a light trace of blue) the barrel is washed out with hot water, then cleaned with a wire brush and dried with cloth patches.

SECTION 2

PROCEDURE FOR HANDLING REFERENCE COMPONENTS

2.1 PURPOSE

To cover the various operations of handloading cartridges assembled with components carefully selected for their uniformity and conformance to specified standards. Reference cartridges are used to establish velocity and pressure values by which weapon serviceability and performance may be determined. The correction factors obtained are to be applied to results of velocity and pressure tests.

2.2 EQUIPMENT

Equipment listed in Handloading section of the appropriate Inspection Equipment List shall be used.

2.3 STORAGE AND CARE OF REFERENCE COMPONENTS

2.3.1 An inventory of all reference components (bullets, cases, and propellant) shall be maintained to show the quantities on hand and the quantities used each month. As additional components are needed, they shall be requisitioned from the responsible installation. Bullets and primed cases must be handled with care to prevent damage to dimensions because of the close tolerances to which they are made. Bullets and primed cases may be stored within the building, preferably at a temperature of 70°F.

2.3.2 Reference propellants are packed in hermetically tight containers and stored in dry, well-ventilated magazines reserved for this purpose. When the propellant is protected in this manner it may be stored for an unlimited time without any change in moisture content.

2.3.2.1 A moisture control chart shall be maintained showing the moisture content on each propellant sample of current use. When a sample of propellant is removed from the sealed container, it shall be so handled as to prevent any change in moisture content, preferably in small containers which can be closed quickly and tightly. The containers shall be identified and the moisture control chart shall indicate whenever a new container is opened. While the propellant is being used from one container, the moisture content shall be determined at least once each week. It shall also be necessary to determine the moisture content on a second container, so that if the moisture content of the first sample falls outside the control limits, there will be a replacement available for use.

2.4 MAINTENANCE OF MOISTURE CONTENT OF REFERENCE PROPELLANT

2.4.1 Once each week a sample of each active propellant shall be selected and sent to the Laboratory for moisture determination in accordance with test method contained in MIL-STD-286 (Propellants, Standard for Methods of Sampling, Inspection and Testing). The results of these tests shall be maintained on the control chart. The moisture content shall be maintained within $\pm$ .04 percent of the assessed value. If the moisture content deviates by more than $\pm$ .04 percent, but by less than $\pm$ .08 percent, it is permissible to continue using the propellant, but the moisture content should be adjusted as soon as possible. If the moisture content is beyond $\pm$ .08 percent, then the propellant shall not be used, but shall be replaced by a new container of propellant.

2.4.2 When moisture content falls below the permissible value, it shall be increased by adding a calculated amount of water.

Example equation:

$$\frac{7000WC}{100} = X$$

Where W = Weight of propellant sample, in pounds.
C = Correction desired, in % moisture content.
X = Weight of water (in grains) to be added to propellant sample.

2.4.2.1 Place blotter on scale and balance with proper weights on weight pan, then add weights the equivalent to the weight of water to be added to the propellant. Using an eye-dropper, drop enough water on the blotter to balance the weights on weight-pan.

2.4.2.2 Place blotter on surface of propellant in container and replace lid. Blotter shall be left in container for approximately sixteen hours.

2.4.2.3 When blotter is removed from container, lid shall be replaced and propellant blended thoroughly by shaking and tumbling.

2.4.3 When moisture content is above the permissible value, it shall be corrected by placing a quantity of suitable desiccant in a container.

2.4.3.1 The container with the desiccant is placed on the surface of the propellant sample, the lid of the propellant container is then replaced, exposing the reference propellant to the desiccant.

2.4.3.2 When desiccant is removed from the propellant container, the lid is replaced and propellant blended thoroughly by shaking and tumbling.

2.4.4 After each addition or removal of moisture, a new moisture determination shall be made in accordance with test method contained in MIL-STD-286 to determine whether further processing is necessary or the propellant may be used.

2.5 OPERATION OF HANDLOADING REFERENCE CARTRIDGES

Reference cartridges shall be handloaded in a room having a controlled temperature of 70°F., ± 2°F., and a relative humidity of 60, ± 5 percent.

2.5.1 Upon removal from the storage area, all reference components shall be conditioned at a constant temperature of 70°F., ± 2°F., for a minimum of twenty-four hours.

2.5.2 Whenever propellant samples are received in more than one container and it is required to obtain results on the blend, the samples shall be thoroughly blended by pouring the propellant through the blending tower no less than five times.

2.5.3 Components (primed cases, bullets, and propellant) are placed at an accessible point to the balance. Cases are placed in a recessed holding block, primer-end down. The amount of propellant exposed to the atmosphere should always be held to a minimum.

2.5.4 Balance is leveled and the correct weights applied for the propellant charge to be weighed. Propellant shall be weighed to 0.1 grain. (When necessary to check weight of propellant in a cartridge, it shall be checked to the nearest 0.01 grain.) Balance should be checked at bi-weekly intervals.

2.5.5 The funnel is placed in the mouth of the case and the propellant poured slowly and evenly through the funnel into the case, preferably from a height of approximately three inches above the mouth of the case. Care should be taken that a minimum amount of propellant strikes the sides of the funnel. Propellant shall be poured in this manner to assure that proper airspace is obtained. The funnel is removed and an inverted bullet is placed in the mouth of the case.

2.5.6 After the required number of cases has been loaded, the bullets are removed and then carefully seated to the proper depth, using a bullet-seating press. Each cartridge is then measured for overall length and shall be within dimensions shown on the applicable drawing.

2.5.7 Handloaded reference cartridges are not crimped or waterproofed.

2.5.8 Handloaded reference cartridges should be used within twenty-six (26) hours after assembly, if practicable; however, it is permissible to use reference cartridges within a seventy-two (72) hour period.

2.5.9 Reference cartridges shall be fired prior to firing the test cartridges. One reference cartridge shall be fired for each cartridge of the test sample to be fired, up to twenty (20) cartridges. When the test consists of more than twenty (20), but not more than forty (40) cartridges, then twenty (20) reference cartridges shall be fired. When the test consists of more than forty (40) cartridges, then one (1) reference cartridge shall be fired for every two (2) test cartridges.

2.6 ASSESSMENT OF REFERENCE CARTRIDGES

2.6.1 Handloaded reference cartridges

Whenever a new component is introduced (e.g., bullet, cartridge case, primer, or propellant) it is necessary to fire a complete assessment test. Assessment tests are conducted by U. S. Army Frankford Arsenal; the tests are conducted over a three-day period. If satisfactory results are obtained during the assessment, components of the same type as those used for the assessment are forwarded to all interested facilities. Upon receipt of the necessary components, each facility conducts a simulated assessment, following the procedure prescribed in 2.7.

2.6.2 Machine-loaded reference cartridges

U. S. Army Frankford Arsenal procures a lot of ammunition. A complete assessment is then conducted over a three-day period. If satisfactory results are obtained during the assessment, cartridges from the same lot as those used for the assessment are distributed to all interested facilities. Upon receipt of the necessary cartridges, each facility conducts a simulated assessment, following the procedure prescribed in 2.7, disregarding hand-loading operation and moisture determination.

2.7 SIMULATED ASSESSMENT OF REFERENCE CARTRIDGES

Simulated assessment tests are conducted by each proof testing facility involved in the testing of the particular ammunition type, upon receipt of the assessment data from the originating installation. Components representing the same lots as those used for the assessment data (primed cases, bullets, and propellant) shall be procured from the responsible installation, assembled, and fired upon receipt. If possible, the same lot of copper pressure cylinders shall be used. If the assessment was performed with fixed reference cartridges, then the required quantity of cartridges shall be procured from the originating installation.

2.7.1 The moisture-volatile content which was determined at the originating installation is published with the assessment values. Each container of reference propellant shall contain a slip showing moisture-volatile content. Upon receipt, each facility shall determine the moisture-volatile content of each container of propellant in accordance with the test method contained in MIL-STD-286.

2.7.1.1 If the moisture-volatile content obtained is within $\pm$0.10 percent of the assessed value, each facility shall establish this local content as an original value and use the propellant for reference firings.

2.7.1.2 If the moisture-volatile content obtained by individual facilities is not within $\pm$ 0.10 percent of the assessed value, four 2-ounce samples of the propellant are placed in glass, rubber-stoppered bottles (2-oz) labelled to show name of propellant, lot number, facility, and date. The samples are immediately forwarded to the originating installation for moisture-volatile check purposes. The propellant shall not be used as a reference propellant until the moisture-volatile content has been adjusted.

2.7.1.3 Check tests of moisture-volatile content shall be made in accordance with test method contained in MIL-STD-286 upon active reference propellants by all using facilities as often as necessary, with a minimum of one test per lot, each week.

2.7.2 Preparation for firing

2.7.2.1 Three-hundred and five (305) cartridges, identical with the ones used for the assessment, shall be placed in the controlled-temperature container or room for a minimum of two (2) hours. Two hundred (200) cartridges shall have undrilled cases and one-hundred and five (105) shall have drilled cases.

2.7.2.1.1 Cases shall be drilled in a press using the drill jig listed in the Inspection Equipment List, to assure that the hole is drilled in the specified position. A #47 drill (.0785" dia.) shall be used, exercising great care to assure that the drill does not penetrate into the case far enough to remove any propellant. (Should hand-loaded cartridges be used, the cases may be drilled before loading and assembly.) As each cartridge or case is secured in the jig for drilling, an indentation is automatically made on the cartridge case approximately 1/32" forward of the extractor groove. The indentation is in the same axial plane with the drilled hole and serves as a guide when the cartridge is fixed in the cartridge-inserter. After the cartridge has been secured in the cartridge-inserter, the indent mark on the cartridge case shall be carefully aligned with the mark on the aligning finger of the inserter; this assures proper alignment of the drilled hole in the case with the piston hole in the barrel when the cartridge is chambered for firing.

2.7.2.1.2 After drilling each cartridge, or case, a piece of tape (shielding, pressure sensitive) 1/2 by 1/2" shall be placed over the drilled hole to prevent loss of propellant during handling.

2.7.2.2 Five chamber-pressure barrel assemblies and five port-pressure barrel assemblies are selected. They shall have dimensions within the values prescribed for proof test weapons of the type involved. The chamber-pressure assemblies shall contain barrels which have fired between 100 and 300 cartridges. No barrel-life limit is set for the barrels used in the port-pressure barrel assemblies; however, port-pressure obtained must be within $\pm$ 2000 PSI of the assessed value.

2.7.2.3 The proof technician selects one of the five chamber-pressure barrel assemblies and assembles it in the test fixture, on the mount. The chamber and bore of the barrel are wiped dry. The barrel is then boresighted into position.

2.7.2.4 The pressure barrel assemblies shall be in accordance with the applicable drawings; if the "no-go" gages enter either the upper or lower end of the piston hole, the barrel assembly shall be disqualified.

2.7.2.5 The following measurements shall be made before a pressure-barrel assembly is placed in service, after misfires, pierced primers, flowbacks, or whenever a part replacement has been made in the bolt assembly:

	Limits
Firing-pin protrusion	.060" - .068"
Firing-pin indent	.020" - .025"
Headspace (to be 0.400" datum dia.)	1.628" - 1.631"

2.7.2.6 The firing range shall be set-up as shown on Chart #1, at the end of this section. Lumiline screens are checked for position. It is of the utmost importance that the lumiline screens be placed in their proper positions; measurements must be accurate.

2.7.3 Velocity firing

2.7.3.1 The long piston is placed in the piston hole but not fully seated until after the cartridge is in the chamber.

2.7.3.2 Five (5) warmer (fouling) shots shall be fired. Velocity readings should be recorded by the chronographer to assure that the velocity-measuring equipment is functioning properly.

2.7.3.3 The recessed holding block containing twenty (20) cartridges is removed from the loading room or controlled-temperature container and placed at a point convenient to the technician, provided the temperature of the firing room is 70°F., ± 5°F.; otherwise the cartridges shall be placed in an insulated box (five (5) cartridges at a time) which has been conditioned at 70°F., ± 5°F., and the box placed at a point convenient to the technician, the cartridges are then removed singly from the insulated box immediately before firing. If an insulated box is not available, then the cartridges shall be removed singly from the controlled-temperature room or container and fired. The loading room or controlled-temperature container, or both, shall be maintained at 70°F., ± 5°F., and a relative humidity of 60, ± 5 percent.

2.7.3.4 In order that the propellant shall be uniformly positioned from cartridge to cartridge before firing, attention to detail is necessary in handling and chambering the cartridge. The cartridge shall first be held vertically, bullet upward, and then rotated slowly, end over end in a vertical plane, stopping the rotation momentarily after 180° of rotation when the bullet is downward, and then continuing through the remainder of 360°, stopping with the cartridge again bullet-end upward. The bullet-end of the cartridge should now be lowered slowly to a position slightly above horizontal. The cartridge shall then be chambered very carefully, taking care that the primer-end of the case is not elevated above the bullet-end of the case, and making certain the shank of the long piston is not blocking the chamber. (The object is to have the cartridge seated in the chamber ready to fire, with the propellant in a loose condition at the primer end of the case.)

2.7.3.5 The long piston, which is not removed from the piston hole from cartridge to cartridge, is aligned so that the concave base of the shank fits over the radius of the cartridge case. The anvil is then screwed down on the piston to a snug position, but not under stress.

2.7.3.6 The breech-block shall be closed gently and the trip lever to which the lanyard is attached shall be carefully engaged with the hammer. If the technician encounters any difficulty closing the breech-block or engaging the trip lever, the test shall be discontinued until such difficulty is corrected. If any delay should occur after the cartridge is placed in the chamber, and the duration of the delay is such that the temperature of the cartridge has changed significantly, that cartridge shall be extracted and another inserted in its place.

2.7.3.7 The technician retires to a safe position and pulls the lanyard with a smooth firm motion. The velocity of the shot shall be recorded by the chronographer. The anvil is unscrewed releasing the pressure on the fired case, the breech-block is opened and the fired case extracted and visually examined by the technician for possible case casualties.

2.7.3.8 The procedure prescribed in 2.7.3.4 through 2.7.3.7 is repeated until the twenty cartridges have been fired.

2.7.3.9 Continuous air cooling should be used on the barrel. If air cooling is not available, the barrel shall be allowed to cool to ambient temperature between each series of tests, or after a maximum number of twenty cartridges has been fired. At no time shall the exposed metal surface of the test barrel become too hot to grasp with the bare hands (approx. 140°F.).

2.7.3.10 If any of the personnel conducting the test observes any abnormality tending to invalidate the velocity measurements, the circumstances shall be reported immediately through appropriate supervisory channels and the test suspended until instructions are received from proper authority.

2.7.4 Chamber-Pressure firing

Upon completion of the long piston velocity firing and before removing the barrel from the fixture, the chamber-pressure firing shall be conducted.

2.7.4.1 Twenty-one (21) copper pressure cylinders are measured individually and placed in a recessed holding block. The recessed holding block containing the cylinders, the short piston, and a sufficient quantity of obturators are placed at a point convenient to the

technician. The obturators shall be the wax-filled type. One obturator shall be used for a series of twenty-one cartridges; the first cartridge of each series of twenty-one (21) is used to seat the obturator properly in the piston hole. Both the velocity and pressure obtained with this cartridge shall be recorded; however, the velocity and pressure obtained with this cartridge shall be disregarded and not included when calculating the averages.

2.7.4.2 The recessed holding block containing the twenty-one (21) cartridges (drilled) is removed from the controlled-temperature room or container and placed at a point convenient to the technician, provided the temperature of the firing room is 70°F., ± 5°F.; otherwise the cartridges shall be placed in an insulated box (five (5) cartridges at a time) which has been conditioned at 70°F., ± 5°F., and the box placed at a point convenient to the technician; the cartridges are then removed singly from the insulated box immediately before firing. If an insulated box is not available, then the cartridges shall be removed singly from the controlled-temperature room or container and fired. The controlled-temperature room or container, or both, shall be maintained at 70°F., ± 2°F., and a relative humidity of 60, ± 5 percent.

2.7.4.3 The dummy cartridge (obturator catcher) is placed in the chamber of the pressure barrel assembly, making certain the opening in the dummy cartridge case is not aligned with the piston hole. The obturator shall then be placed in the piston hole, mouth-end down, and partially seated using the stem of the knockout tool. The shank of the pressure piston shall be dipped in oil, SAE40 or equivalent, and the oil then be allowed to drain from the piston. The drop of oil adhering to the bottom of the piston shank shall then be removed by touching the bottom of the piston shank to a cloth cleaning patch. The piston shall then be inserted into the piston hole and pressed down on the obturator until the piston has reached its correct final position. The head of the piston and the bottom of the anvil shall be wiped dry and free of oil. The copper cylinder shall be put in place and centered between the head of the piston and the bottom of the anvil. The anvil shall be screwed down lightly on the cylinder using the thumb and forefinger. The dummy cartridge (obturator catcher) shall then be removed from the chamber. The first cartridge to be fired shall be fixed in the cartridge inserter and carefully positioned so that the mark on the aligning finger of the inserter and the indentation on the cartridge case are aligned properly.

2.7.4.4 In order that the propellant shall be uniformly positioned from shot to shot, attention to detail is necessary in handling and chambering the cartridge. The cartridge-inserter with the cartridge attached shall first be held vertically, bullet upward, with

the drilled hole in the cartridge case facing the technician. It shall then be rotated slowly in a vertical plane, stopping the rotation momentarily after 180° of rotation when the bullet is downward, and then continuing through the remainder of 360°, stopping with the cartridge again bullet-end upward. The bullet-end of the cartridge should now be lowered slowly to a position slightly above horizontal, with the drilled hole in the cartridge case facing upward. The tape covering the drilled hole shall be removed from the cartridge case, taking care that none of the propellant adheres to the tape. The cartridge shall be chambered very carefully taking care that the primer-end of the case is not elevated above the bullet-end of the case. To assure proper alignment of the cartridge for the pressure measurement, the aligning finger of the cartridge-inserter must be fitted into the extractor notch on the pressure barrel assembly. The cartridge-inserter shall be held firmly against the chambered cartridge and the releasing plunger depressed freeing the chambered cartridge from the inserter. (The object is to have the cartridge seated in the chamber ready to fire, with the propellant in a loose condition at the primer-end of the case, and with such airspace as is present at the bullet-end of the case.)

2.7.4.5 The breech-block is closed gently. If the technician encounters any difficulty closing the breech-block or engaging the trip lever, the test shall be discontinued until such difficulty is corrected. If any delay should occur after the cartridge is placed in the chamber and the duration of the delay is such that the temperature of the cartridge has changed significantly, that cartridge shall be extracted and another inserted in its place.

2.7.4.6 The technician makes a final check to assure that the anvil is screwed to a snug position on the copper cylinder. Care is taken to see that the copper cylinder is not compressed by the anvil prior to firing. The proper torque to be applied to the thumb-screw is about one pound-inch. (This torque can be estimated with satisfactory accuracy
erienced technician; to familiarize inexperienced technicians
desired degree of tightness, a torque-measuring device may be
This can be accomplished by drilling and tapping (threading)
ıole in the knurled head of the anvil (thumb-screw) and insert-
; or screw to which a torque-measuring wrench can be attached.
ıness of the anvil (thumb-screw) is not impaired by this modi-
)

4.7 The trip lever, to which the lanyard is attached, shall
l gently to the hammer. The technician retires to a safe posi-
ulls the lanyard with a smooth firm motion. The velocity of
hall be recorded by the chronographer.

2.7.4.8 The copper cylinder shall be removed and placed in the recessed holding block. The piston is not removed from the piston hole, but is returned to its correct final position; this can be accomplished by gently tapping the head of the piston with the knockout tool. The next copper cylinder shall be put in place and centered between the head of the piston and the bottom of the anvil. The anvil shall be screwed down lightly on the cylinder, using the thumb and forefinger. The breech-block shall be opened, the fired case extracted and visually examined by the technician for possible case casualties. The chamber and bore shall be checked for the possibility of any obstruction remaining in the barrel.

2.7.4.9 The procedure prescribed in 2.7.4.4 through 2.7.4.8 is repeated until the twenty-one (21) cartridges have been fired. Upon completion of the reference firing, the piston shall be removed from the piston hole. The dummy cartridge (obturator catcher) shall be inserted into the chamber with the drilled hole aligned with the piston hole and the obturator forced into it with the knockout tool. The dummy cartridge (obturator catcher) shall then be removed from the chamber. Cooling of the barrel shall be in accordance with 2.7.3.9.

2.7.4.10 The copper pressure cylinders whose identities are maintained throughout the test are measured in the same manner as they were prior to the test. The difference in length (set in inches) is then applied to the proper tarage table to obtain the corresponding PSI. The chamber pressure for each shot is recorded on the test sheet opposite the corresponding velocity result.

2.7.4.11 The procedure prescribed in 2.7.3.1 through 2.7.4.10 is then repeated in each of the four remaining chamber pressure barrel assemblies.

2.7.5 Port-Pressure Firing

2.7.5.1 The proof technician selects one of the five port-pressure barrel assemblies and assembles it in the test fixture, on the mount. The chamber and bore of the barrel are wiped dry. The barrel is then boresighted into position.

2.7.5.2 Twenty copper pressure cylinders are measured individually and placed in a recessed holding block. The recessed holding block containing the cylinders, a sufficient quantity of obturators (use a new obturator for each cartridge to be fired) and the short piston previously fitted to the test barrel are placed at a point convenient to the proof technician.

2.7.5.3 Warming (fouling) shots are fired in accordance with 2.6.2.2. To fire the warming shots, it shall be necessary to seat an obturator, mouth end down, and the piston in the piston hole. The obturator should be seated using the short stem of the knockout tool. The piston is placed in the piston hole and the anvil screwed down on the head of the piston until the piston has reached its correct final position. The bore of the barrel shall then be checked to assure that the obturator did not enter the bore. Before each warming shot is fired the anvil should be checked to assure that it is in a snug position on the head of the piston.

2.7.5.4 The recessed holding block containing twenty undrilled cartridges is removed from the controlled temperature room or container and placed at a point convenient to the technician, provided the temperature of the firing room is 70°F., ± 5°F.; otherwise the cartridges shall be placed in an insulated box which has been conditioned at 70°F., ± 5°F., and the box placed at a point convenient to the technician; they are then removed singly from the insulated box immediately before firing. If an insulated box is not available, then the cartridges shall be removed singly from the controlled-temperature room or container immediately before firing. The controlled-temperature room or container, or both, shall be maintained at 70°F., ± 2°F., and a relative humidity of 60, ± 5 percent.

2.7.5.5 The dummy (obturator catcher) is not used when firing port-pressure. The obturator which was used when the warming shots were fired is forced into the bore of the barrel using the long stem of the knockout tool. The obturator shall be removed from the bore by using a cleaning rod or blown out by air.

2.7.5.6 The procedure prescribed in 2.7.4.3 through 2.7.4.7 is followed for each cartridge to be fired, disregarding the use of the dummy cartridge (obturator catcher) and the use of drilled cartridge cases.

2.7.5.7 The breech-block shall be opened and the fired case extracted and visually examined by the technician for possible case casualties. The copper cylinder shall be removed and placed in the recessed holding block. The piston shall be removed from the piston hole. The obturator shall be forced into the bore using the long shank of the knockout tool. The obturator shall be removed from the bore by using a cleaning rod or blown out by air. Caution shall be taken before firing each cartridge to insure that no obstruction is in the barrel.

2.7.5.8 The procedure prescribed in 2.7.5.6 and 2.7.5.7 shall be repeated until the required number of cartridges has been fired. Cooling of barrel shall be in accordance with 2.7.3.9.

2.7.5.9 The copper pressure cylinders whose identities are maintained throughout the test are measured in the same manner as they were prior to the test. The difference in length (set in inches) is then applied to the proper tarage table, and the corresponding PSI is obtained. The port-pressure for each shot is recorded on the test sheet opposite the corresponding velocity result.

2.7.5.10 The procedure prescribed in 2.7.5.2 through 2.7.5.9 is then repeated in each of the four remaining port-pressure barrel assemblies. This constitutes the first day's firing.

2.7.5.11 The procedure prescribed in 2.7.2.3 through 2.7.5.10 is then repeated twice more, preferably upon succeeding days.

2.7.5.12 If, during the firing of a simulated assessment, the values differ from the proposed assessment by more than $\pm$ 25 F/S for velocity, $\pm$ 2500 PSI for chamber pressure, or $\pm$ 1500 PSI for port pressure, in either average results of all weapons or in average results of any three weapons (60 percent of the equipment used), the simulated assessment tests shall be repeated in different barrels.

2.7.5.13 If an individual proof test facility, during firing of a simulated assessment, obtains poor uniformity within the tests, or poor reproducibility between the tests, or abnormal relationships between the results obtained in a chamber-pressure barrel assembly using the long piston and those obtained using the short piston, that proof test facility is requested to repeat the tests, and if necessary, is given specialized assistance in an effort to determine the causes thereof.

2.7.5.14 Upon completion of the simulated assessment tests, duplicate copies of the individual ballistic sheets as well as duplicate copies of a summary table of average results shall be forwarded to the installation responsible for publishing the assessment values, where a complete study of the data shall be made.

2.7.5.15 If the average results of the simulated assessment test are within $\pm$ 15 F/S for velocity, $\pm$ 1500 PSI for chamber pressure, $\pm$ 1000 PSI for port pressure of the proposed assessment values, and the general agreement between ranges be acceptable, the assessment becomes official and is so announced immediately.

2.7.5.16 Should the majority of participating proof test facilities be not in close agreement with the proposed assessment, the assessment and the simulated assessment shall be refired. Results of all tests will be evaluated by the installation responsible for publishing the assessment values, and no official pronouncement made until the differences are reconciled.

2.7.5.17 Upon publication of the official assessment values, the use of the reference cartridges becomes mandatory for all proof test facilities testing ammunition of that type, for use in establishing range or equipment corrections when firing velocity and pressure tests.

2.8 ACCEPTANCE OF REFERENCE COMPONENTS

Whenever a new lot of reference components is received, of a type which has been previously assessed to a completed cartridge, it will be necessary to follow the procedure prescribed below:

2.8.1 Handloading

2.8.1.1 Sixty-three (63) cartridges (30 with undrilled cases and 33 with drilled cases) shall be handloaded using reference components of current use.

2.8.1.2 Sixty (60) cartridges (30 with undrilled cases and 30 with drilled cases) shall be handloaded using the new component plus reference components.

2.8.1.3 In every instance the reference cartridge and the component being accepted must be assembled with the same material, except for the one component under test, and handloaded in accordance with 2.5.

2.8.2 Preparation for Firing

2.8.2.1 Three chamber-pressure barrel assemblies shall be selected. They must not have corrections greater than ± 35 F/S or ± 3500 PSI, when firing reference cartridges and shall have dimensions within the value prescribed for proof test weapons of the type involved. Test fixture shall be arranged as shown on the applicable drawing.

2.8.2.2 The firing range shall be set up as shown on Chart #1, at the end of this section. Lumiline screens are checked for position. It is of the utmost importance that the lumiline screens be placed in their proper positions, measurements must be accurate. Minimum distance between screens shall be 50 feet.

2.8.2.3 The proof technician selects one of the three pressure barrel assemblies and assembles it in the test fixture on the mount. The chamber and bore of the barrel are wiped dry. The barrel is then boresighted into position.

2.8.3 Velocity firing

2.8.3.1 The long piston is placed in the piston hole but not fully seated until after the cartridge is in the chamber.

2.8.3.2 Five (5) warmer (fouling) shots shall be fired. Velocity readings should be recorded by the chronographer to assure that the velocity-measuring equipment is functioning properly.

2.8.3.3 The recessed holding block containing ten cartridges containing the current reference components (undrilled cases) and ten cartridges containing the new component (undrilled cases) is removed from the loading room or controlled temperature container and placed at a point convenient to the technician, provided the temperature of the firing room is 70°F., ± 5°F.; otherwise the cartridges shall be placed in an insulated box which has been conditioned at 70°F., ± 5°F., and the box placed at a point convenient to the technician; the cartridges are then removed singly from the insulated box immediately before firing. If an insulated box is not available, then the cartridges shall be removed singly from the controlled-temperature room or container and fired. The controlled-temperature room or container, or both, shall be maintained at 70°F., ± 2°F., and a relative humidity of 60, ± 5 percent.

2.8.3.4 The two series of cartridges (10 old and 10 new) are then fired alternately (one old; one new; one old, etc.) until all cartridges have been fired.

2.8.3.5 In order that the propellant shall be uniformly positioned from cartridge to cartridge before firing, the cartridge shall be held in a vertical position and then slowly rotated end over end in a vertical plane through 360°, stopping the cartridge momentarily during rotation when the bullet-end is down and after rotation when the primer-end is down.

2.8.3.6 The cartridge shall be chambered very carefully, taking care that the primer-end of the case is not elevated above the bullet-end of the case, and making certain the shank of the long piston is not blocking the chamber. This method of handling is to insure that the propellant is maintained in a uniform manner from cartridge to cartridge. (The object is to have the cartridge seated in the chamber ready to fire with the propellant in a loose condition at the primer-end of the case, and with such airspace as is present, at the bullet-end of the case.)

2.8.3.7 The long piston, which is not removed from the piston hole from cartridge to cartridge, is aligned so that the concave base of the shank fits over the radius of the cartridge case. The anvil is then screwed down on the piston to a snug position, but not under stress.

2.8.3.8 The breech-block shall be closed gently and the trip lever to which the lanyard is attached shall be carefully engaged to the hammer. If the technician encounters any difficulty closing the breech-block or engaging the trip lever, the test shall be discontinued until such difficulty is corrected. If any delay should occur after the cartridge is placed in the chamber and the duration of the delay is such that the temperature of the cartridge has changed significantly, that cartridge shall be extracted and another inserted in its place.

number of thirty (30) cartridges has been fired. At no time shall the exposed metal surface of the test barrel become too hot to grasp with the bare hands (approx. 140°F.).

2.8.3.12 If any of the personnel conducting the test observes any abnormality that may invalidate the velocity or pressure measurements, the circumstances shall be reported immediately through appropriate supervisory channels and the test suspended until instructions are received from proper authority.

2.8.3.13 The average velocity of both the old and new components are computed by the chronographer.

2.8.4 Chamber-Pressure firing

2.8.4.1 Upon completion of the long piston velocity firing in the first chamber-pressure barrel assembly, twenty-one copper pressure cylinders (eleven to be used with the old components and ten to be used with the new components) are measured individually and placed in a recessed holding block. The recessed holding block containing the cylinders, the short piston, and a sufficient quantity of obturators should be placed at a point convenient to the technician. The obturators shall be of the wax-filled type. One obturator shall be used for a series of twenty-one (21) cartridges; the first cartridge of the series shall be fired to seat the obturator properly in the piston hole. Both the velocity and pressure obtained with this cartridge shall be recorded, for information only. Neither value shall be considered when calculating the averages.

2.8.4.2 The recessed holding block containing the twenty-one (21) drilled cartridges (eleven old and ten new) is removed from the controlled temperature container or room and placed at a point convenient to the technician, provided the temperature of the firing-room is 70°F., ± 5°F.; otherwise the cartridges shall be placed in an insulated box which has been conditioned at 70°F., ± 5°F., and the box placed at a point convenient to the technician; the cartridges are then removed singly from the insulated box immediately before firing. If an insulated box is not available, the cartridges shall be removed singly from the controlled-temperature room or container immediately before firing. The controlled-temperature room or container, or both, shall be maintained at 70°F., ± 2°F., and a relative humidity of 60, ± 5 percent.

2.8.4.3 The dummy cartridge (obturator catcher) shall be placed in the chamber of the pressure barrel assembly, making certain the opening in the dummy cartridge case is not aligned with the piston hole. The obturator shall then be placed in the piston hole, mouth end down, and partially seated using the stem of the knockout tool.

The shank of the pressure piston shall be dipped in oil, SAE40 or equivalent, and the oil then be allowed to drain from the piston. The drop of oil adhering to the bottom of the piston shank shall then be removed by touching the bottom of the piston shank to a cloth cleaning patch. The piston shall then be inserted into the piston hole and pressed down on the obturator until the piston has reached its correct final position. The head of the piston and the bottom of the anvil shall be wiped dry and free of oil. The copper cylinder shall be put in place and centered between the head of the piston and the bottom of the anvil. The anvil shall be screwed down lightly on the cylinder, using the thumb and forefinger. The dummy cartridge (obturator catcher) shall then be removed from the chamber. The first cartridge to be fired shall be fixed in the cartridge inserter and carefully positioned so that the mark on the aligning finger of the inserter and the indentation on the cartridge case are aligned properly.

2.8.4.4 In order that the propellant shall be uniformly positioned from shot to shot, attention to detail is necessary in handling and chambering the cartridge. The cartridge-inserter with the cartridge attached shall first be held vertically, bullet upward, with the drilled hole facing the technician. It shall then be rotated slowly in a vertical plane, stopping the rotation momentarily after 180° of rotation when the bullet is downward, and then continuing through the remainder of 360°, stopping with the cartridge again bullet-end upward. The bullet-end of the cartridge should now be lowered slowly to a position slightly above horizontal, with the drilled hole in the case facing upward. The tape covering the drilled hole shall be removed from the case, taking care that none of the propellant adheres to the tape. The cartridge shall be chambered very carefully, taking care that the primer-end of the case is not elevated above the bullet-end of the case. To assure proper alignment of the cartridge for the pressure measurement, the aligning finger of the cartridge-inserter must be fitted into the extractor notch on the pressure barrel assembly. The cartridge-inserter shall be held
[illegible] the chambered cartridge and the releasing plunger de-
[illegible]ng the chambered cartridge from the inserter. (The object
[illegible] cartridge seated in the chamber ready to fire, with the
a loose condition at the primer-end of the case, and with
as is present, at the bullet-end of the case.)

2.8.4.6 The technician makes a final check to assure that the anvil is screwed to a snug position on the copper cylinder. The proper torque to be applied to the thumb-screw is about one pound-inch. (This torque can be estimated with satisfactory accuracy by an experienced technician; to familiarize inexperienced technicians with the desired degree of tightness, a torque-measuring device may be employed. This can be accomplished by drilling and tapping (threading) an axial hole in the knurled head of the anvil (thumb-screw) and inserting a bolt or screw to which a torque-measuring wrench can be attached. The usefulness of the anvil (thumb-screw) is not impaired by this modification.)

2.8.4.7 The trip lever, to which the lanyard is attached, shall be engaged gently with the hammer. The technician retires to a safe position and pulls the lanyard with a smooth firm motion. The velocity of the shot shall be recorded by the chronographer.

2.8.4.8 The copper cylinder shall be removed and placed in the recessed holding block. The piston is not removed from the piston hole, but is returned to its correct final position; this can be accomplished by gently tapping the head of the piston with the knockout tool. The next copper cylinder shall be put in place and centered between the head of the piston and the bottom of the anvil. The anvil shall be screwed down lightly on the cylinder, using the thumb and forefinger. The breech-block shall be opened, the fired case extracted and visually examined by the technician for possible case casualties. The chamber and bore shall be checked for the possibility of any obstruction remaining in the barrel.

2.8.4.9 The procedure prescribed in 2.8.4.4 through 2.8.4.8 shall be repeated until the required number of cartridges has been fired. Upon completion of the firing the piston shall be removed from the piston hole. The dummy cartridge (obturator catcher) shall be inserted into the chamber with the drilled hole aligned with the piston hole and the obturator forced into it, using the stem of the knockout tool. The dummy cartridge (obturator catcher) shall then be removed from the chamber.

2.8.4.10 The copper pressure cylinders whose identities are maintained throughout the test, are measured in the same manner as they were prior to the test. The difference in length (set in inches) is then applied to the proper tarage table, and corresponding PSI is obtained and recorded on the report form.

2.8.4.11 The procedure prescribed in 2.8.3.1 through 2.8.4.10 is then repeated in each of the two remaining pressure-barrel assemblies. The average velocity and average pressure of the three barrels are then computed.

2.8.4.12 In order for the new component to be considered acceptable, the average velocity or pressure of the three pressure barrel assemblies using the new component must not vary from the average velocity or pressure of the reference cartridge by more than $\pm$15 F/S or $\pm$1500 PSI, respectively.

SUGGESTED FORMAT

Propellant:	Engineering Proof Testing Record Bullet Extraction Test	Ammunition:
Type		Lot
Army Lot		Type
Charge		Caliber
Case		Bullet
Primer	Spec/Auth	Wt. Grn.

Type of Machine
Rate of Loading - Lbs/min:
Rate of travel of Pulling Head: - Inches/min:

Calibration Points	30	60	100	150	250
Calibration Error					

Round No.	Extraction weight in lbs.			
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				
Average				
Max				
Min				

Remarks:

Proof Technician(s)
Date of Test

SECTION 7

CHAMBER PRESSURE TEST PROCEDURE

7.1 PURPOSE

The Chamber Pressure test is a precisely controlled test to determine the pressure exerted, expressed in pounds per square inch, in the chamber of a gun. The test is performed as a safety measure to insure that the pressure developed by the ammunition is safe for firing in the weapon for which it is intended.

7.2 EQUIPMENT

7.2.1 Equipment listed in the Chamber Pressure section of the appropriate Inspection Equipment List shall be used.

7.2.2 The firing range shall be arranged as shown on Chart #1, at the end of this section. The minimum distance between the lumiline screens shall be fifty (50) feet.

7.2.3 The pier or mount, on which the test fixture assembly is mounted, shall be of solid construction.

7.3 USE OF REFERENCE CARTRIDGES

7.3.1 Reference cartridges shall be used to establish range and equipment corrections prior to firing an ammunition lot for acceptance.

7.3.2 After a minimum of twenty-one (21) reference cartridges has been fired in the pressure barrel assembly to be used for the test, the observed mean chamber pressure of the reference cartridges, disregarding the first shot, shall be compared with the assessed value. If the assessed value is higher, the difference is a plus correction and shall be added to the mean chamber pressure obtained with the test cartridges. If the assessed value is lower, the difference is a minus correction and shall be subtracted from the mean chamber pressure obtained with the test cartridges. If both values are identical, no correction is applied.

7.3.3 The pressure-barrel assembly will be acceptable provided the results obtained with the reference cartridges are within $\pm$ 3500 PSI of the assessed value.

7.3.4 It is suggested that control charts be maintained, for record purposes, of the results from each barrel in which reference cartridges are fired.

7.4 MEASUREMENT OF COPPER PRESSURE CYLINDERS

7.4.1 The chamber-pressure shall be determined by using the radia copper pressure cylinders. One cylinder shall be used for each cartridge fired.

7.4.1.1 The copper pressure cylinders shall be measured individually using a properly calibrated micrometer graduated to 0.0001 inch. The cylinders shall be measured prior to firing, measurements recorded and the cylinders placed in a recessed holding block in such a manner that their identity is maintained throughout the test.

7.4.1.2 Upon completion of the firing the cylinders shall be measured again, and the decrease in length obtained by subtraction of the actual readings. The decrease in length obtained for each cylinder shall then be applied to the appropriate tarage table (a tarage table is supplied with each box of copper pressure cylinders) and the corresponding chamber pressure (PSI) shall be recorded on the test report form in such a manner that the velocity of each cartridge can be identified with the corresponding chamber-pressure obtained.

7.4.2 Whenever a new supply of copper pressure cylinders is received involving the use of different tarage tables, they shall be tested in comparison with the cylinders being replaced by firing forty (40) reference cartridges (exclusive of the first unrecorded shot of each 20-shot series) for chamber pressure in a pressure-barrel assembly of known characteristics, using twenty (20) of the new cylinders in alternation with twenty (20) of the old cylinders. The mean chamber pressure obtained with the new cylinders shall not vary by more than ± 1500 PSI from the mean obtained with the old cylinders. If the means vary by more than ± 1500 PSI, the new lot shall be considered unacceptable.

7.5 TEST PROCEDURE

Pre-firing (Preparation for test)

[illegible] the required number of test cartridges (21) and reference cartridges (21) shall be drilled in a press using a drill jig listed in the Inspection Equipment List, to assure that the hole is drilled in the specified position. A #47 drill (.0785 in. dia.) shall be used, exercising great care to assure that the drill does not penetrate into the case far enough to remove any propellant. (Should hand-loaded reference cartridges be used, the cases may be drilled before loading and assembly.) A piece of tape (shielding, pressure sensitive) 1/2 by 1/2", shall be placed over the drilled hole to prevent loss of propellant during handling. As each cartridge is secured in the jig for drilling, an indentation is automatically made on the cartridge case approximately 1/32"

forward of the extractor groove. The indentation is in the same axial plane with the drilled hole and serves as a guide when the cartridge is fixed in the cartridge-inserter. After the cartridge has been secured in the cartridge-inserter, the indent mark on the cartridge case shall be carefully aligned with the mark on the aligning finger of the inserter; this assures proper alignment of the drilled hole in the case with the piston hole in the barrel when the cartridge is chambered for firing.

7.5.1.2 When drilling cartridges having steel cases, the operator shall remain behind protective cover for a minimum of one minute after drilling each cartridge case.

7.5.1.3 After drilling, the test and reference cartridges shall be permitted to come to a temperature of 60°F. to 80°F., prior to being placed in the temperature-controlled container or room. The recessed holding blocks containing the test and reference cartridges shall be placed in the temperature-controlled container or room in such a manner that all cartridges are subjected to a uniform temperature for a minimum of two (2) hours, prior to firing. The container or room shall be maintained at a temperature of 70°F., ± 2°F., with a relative humidity of 60, ± 5 percent, and be of sufficient capacity to allow free circulation of air.

7.5.1.4 The pressure-barrel assembly is assembled in the test fixture, on the mount. The chamber and bore of the barrel are wiped dry and boresighted into position. The pressure-barrel assembly shall be in accordance with the applicable drawings; if the "no-go" gages enter either the upper or lower end of the piston hole, the barrel assembly shall be disqualified.

7.5.1.5 The following measurements shall be made before firing the test, after misfires, pierced primers, flowbacks, or whenever a part replacement has been made in the bolt assembly:

	Limits
Firing-pin protrusion	.060" - .068"
Firing-pin indent	.020" - .025"
Headspace (to 0.400" datum dia.)	1.628" - 1.631"

7.5.1.6 Lumiline screens are checked for position; measurements must be accurate.

7.5.2 During Firing

7.5.2.1 Five (5) warmer (fouling) shots shall be fired. The long piston shall be used. Velocity readings should be recorded by the chronographer to assure that the velocity-measuring equipment is functioning properly.

7.5.2.2 The recessed holding block containing the individually measured copper pressure cylinders, the short pistons, and a sufficient quantity of obturators should be placed at a point convenient to the technician. The obturators shall be of the wax-filled type. One obturator shall be used for a series of twenty-one (21) cartridges; the first cartridge of the series shall be fired to seat the obturator properly in the piston hole. Both the velocity and pressure obtained with this cartridge shall be recorded; however, the velocity and pressure obtained with this cartridge shall be disregarded and not included when calculating the averages.

7.5.2.3 The recessed holding block containing the reference cartridges may be removed from the controlled-temperature container or room and placed at a point convenient to the technician, provided the temperature of the firing room is 70°F. ± 5°F.; otherwise the cartridges shall be placed in an insulated box (five (5) cartridges at a time) which has been conditioned at 70°F. ± 5°F., and the box placed at a point convenient to the technician. The cartridges shall then be removed singly from the insulated box immediately before firing. If an insulated box is not available, then the cartridges shall be removed singly from the controlled temperature container or room immediately before firing.

hole facing the technician. It shall then be rotated slowly in a vertical plane, stopping the rotation momentarily after 180° of rotation when the bullet is downward, and then continuing through the remainder of 360°, stopping with the cartridge again bullet-end upward. The bullet-end of the cartridge should now be lowered slowly to a position slightly above horizontal, with the drilled hole in the case facing upward. The tape covering the drilled hole shall be removed from the case, taking care that none of the propellant adheres to the tape. The cartridge shall be chambered very carefully, taking care that the primer-end of the case is not elevated above the bullet-end of the case. To assure proper alignment of the cartridge for the pressure measurement, the aligning finger of the cartridge-inserter must be fitted into the extractor notch on the pressure barrel assembly. The cartridge-inserter shall be held firmly against the chambered cartridge and the releasing plunger depressed freeing the chambered cartridge from the inserter. (The object is to have the cartridge seated in the chamber ready to fire, with the propellant in a loose condition at the primer end of the case, and with such airspace as is present at the bullet-end of the case.)

7.5.2.6 The breech-block shall be closed gently. If the technician encounters any difficulty closing the breech block or engaging the trip lever, the test shall be discontinued until such difficulty is corrected. If any delay occurs after the cartridge is placed in the chamber, and the duration of the delay is such that the temperature of the cartridge has changed significantly, that cartridge shall be extracted and another inserted in its place.

7.5.2.7 The technician makes a final check to assure that the anvil is screwed to a snug position on the copper cylinder. The proper torque to be applied to the thumb-screw is about one pound-inch. (This torque can be estimated with satisfactory accuracy by an experienced technician; to familiarize inexperienced technicians with the desired degree of tightness, a torque-measuring device may be employed. This can be accomplished by drilling and tapping (threading) an axial hole in the knurled head of the anvil (thumb-screw) and inserting a bolt or screw to which a torque-measuring wrench can be attached. The usefulness of the anvil (thumb-screw) is not impaired by this modification.)

7.5.2.8 The trip lever, to which the lanyard is attached, shall be engaged gently with the hammer. The technician retires to a safe position and pulls the lanyard with a smooth firm motion. The velocity of the shot shall be recorded by the chronographer.

7.5.2.9 The copper cylinder shall be removed and placed in the recessed holding block. The piston is not removed from the piston hole, but is returned to its correct final position; this can be accomplished

by gently tapping the head of the piston with the knockout tool. The new copper cylinder shall be put in place and centered between the head of the piston and the bottom of the anvil. The anvil shall be screwed down lightly on the cylinder, using the thumb and forefinger. The breech-block shall be opened, the fired case extracted and visually examined by the technician for possible case casualties. The chamber and bore shall be checked for the possibility of any obstruction remaining in the barrel.

7.5.2.10 The procedure prescribed in 7.5.2.5 thru 7.5.2.9 shall be repeated until the required number of reference cartridges has been fired. Upon completion of the reference firing, the piston shall be removed from the piston hole. The dummy cartridge (obturator catcher) shall be inserted into the chamber with the drilled hole aligned with the piston hole and the obturator forced into it, using the stem of the knockout tool. The dummy cartridge (obturator catcher) shall then be removed from the chamber.

7.5.2.11 Continuous air cooling should be used on the barrel. If air cooling is not available, barrel shall be allowed to cool to ambient temperature between each series of tests, or after a maximum number of thirty (30) cartridges has been fired. At no time shall the exposed metal surface of the test barrel become too hot to grasp with the bare hands (approx. 140°F.).

7.5.2.12 The copper pressure cylinders used with the reference cartridges shall then be measured and the measurements recorded in accordance with 7.4.1.2. The chamber pressure correction shall then be obtained as prescribed in 7.3.2.

7.5.2.13 If the mean pressure of the reference cartridges is not within ± 3500 PSI of the official assessed chamber-pressure value, the test barrel shall be removed from the test and another test barrel substituted and another series of reference cartridges fired. If this fails to produce satisfactory pressure results, the cause thereof shall be identified and eliminated before resuming the test.

7.5.2.14 After the barrel has cooled to ambient temperature, the bore shall be cleaned and wiped dry. Warming (fouling) shots shall be fired in accordance with 7.5.2.1.

7.5.2.15 The test cartridges shall then be fired following the procedure prescribed in 7.5.2.2 thru 7.5.2.11.

7.5.2.16 The copper pressure cylinders used with the test cartridges shall then be measured and the measurements recorded in accordance with 7.4.1.2. The chamber-pressure correction obtained with the reference

cartridges shall be applied to the mean chamber-pressure of the test cartridges, as prescribed in 7.3.2.

7.5.2.17 If any of the personnel conducting the test observes any abnormality tending to invalidate the velocity or pressure measurements, the circumstances shall be reported immediately through appropriate supervisory channels and the test suspended until instructions are received from proper authority.

7.6 RECORDING OF DATA

7.6.1 Results of both reference and test cartridges should be recorded directly on the test sheet form. Velocities shall be recorded to the nearest FPS; pressures shall be recorded to the nearest 100 PSI.

7.6.1.1 Reference cartridges. The individual velocities and chamber pressures, average velocity and chamber pressure, and extreme variation of velocity and chamber pressure.

7.6.1.2 Test cartridges. The individual velocities and chamber pressure, average velocity and chamber pressure (not corrected), chamber pressure correction, average chamber pressure (corrected), maximum individual chamber pressure (corrected), extreme variation of the individual velocities and the individual chamber pressures, and standard deviation of the individual chamber pressures.

7.6.1.2.1 When calculating standard deviation, the formula to be used shall be $\sqrt{\frac{1}{N}\Sigma (x-\bar{x})^2}$

7.6.1.3 Number and type of case casualties.

7.6.2 The following pressure barrel assembly data shall be recorded:

a. Receiver number

b. Barrel number

c. Total number of cartridges fired in barrel, prior to test.

SUGGESTED FORMAT

Propellant:	Engineering Proof Testing Record Waterproof Test	Ammunition:
Type		Lot
Army Lot		Type
Charge		Caliber
Case		Bullet
Primer	Spec/Auth	Wt. Grs.

Sample Size	Number of Cartridges			Percentage Waterproof
	No Leak	Slow Leak	Fast Leak	

Location of Leaks:

Remarks:

Proof Technician
Date of Test

CHAPTER 4

COMPONENTS

SECTION 1

PRIMER SENSITIVITY TEST PROCEDURE

1.1 PURPOSE

To determine the sensitivity limits within which the primer functions in order to provide assurance that:

a. The primer will be safe to handle.

b. The primer will fire in the cartridge case and weapon(s) for which it is intended.

1.2 EQUIPMENT

1.2.1 Equipment listed in Primer Sensitivity section of the appropriate Inspection Equipment List shall be used.

1.3 TEST PROCEDURE (complete run-down test)

1.3.1 Preparation for test

1.3.1.1 This test shall be conducted on empty primed cases. In the event that primed cases must be obtained by disassembly of cartridges, the disassembly shall be accomplished in such a manner as to cause the least possible distortion of the cartridge case.

1.3.1.2 The machine shall have a firing-pin protrusion of .058 inches minimum. This shall be measured by seating the firing pin fully against the shoulder stop in the firing-pin retainer, and measuring the resulting protrusion of the point of the firing-pin from the face of the firing-pin retainer. A micrometer, dial indicator, or other suitable measuring instrument shall be used for this purpose. If the firing-pin protrusion is found to be less than the specified dimension, then the firing pin or the firing-pin retainer shall be replaced as necessary to achieve the required firing-pin protrusion.

1.3.1.3 A headsapce gage having a dimension of 1.628 inches shall be placed in the case holder. The case holder shall be lowered, if necessary, until the breech-block closes and clamps freely without interference with the headspace gage. The case holder shall then be adjusted by raising carefully until contact is felt between the head of the gage and the firing-pin retainer when the breech-block is fully closed. To verify that contact has been established between the headspace gage and the firing-pin retainer, the retainer shall be coated

thinly with some colored compound (such as "Prussian blue" in oil) which will be transferred to the opposing surface upon contact. The breech-block shall be closed and clamped, with the headspace gage in place; the breech-block shall then be opened, and the head of the gage inspected for evidence of contact, and adjustment of the case holder refined as necessary. When the proper adjustment has been achieved, the case holder shall be locked in position by tightening the locking collar, and the adjustment shall be verified again using the colored compound and the headspace gage to assure that the adjustment has not been disturbed by tightening the locking collar. The gage shall then be removed from the case holder, and the face of the firing-pin retainer wiped clean.

1.3.1.4 A primed case shall be inserted in the case holder, and the breech-block closed and clamped. The electro-magnet shall be energized and the ball attached thereto. All measurements shall be made between the head of the firing pin and the bottom of the suspended ball. The method of measurement used for indicating height of drop shall be graduated in inches with an accuracy of $\pm$ 1/64 inch. The position of the magnet and ball shall be adjusted so that the height of drop desired can be accomplished. When this adjustment has been completed, the ball shall be removed from the machine.

1.3.1.5 It is suggested that a plumb bob be attached to the magnet and the machine adjusted so that the point of the plumb bob is above the center of the firing pin. The plumb bob shall be removed when this adjustment has been completed. To determine if the drop ball is obtaining central impacts on the firing pin, a small piece of carbon paper may be placed on the head of the firing pin and the ball dropped from various heights. After the ball is dropped each time, the firing pin head shall be inspected to ascertain if the mark left by the carbon paper is in the center of the head. If the ball is not hitting in the center of the head, the cause thereof shall be determined and corrective action taken.

1.3.2 Conducting the test

1.3.2.1.3 Breech block is closed and locked.

1.3.2.1.4 Steel ball of appropriate size is suspended from magnet.

1.3.2.1.5 Key is pressed to break circuit and permit ball to fall.

1.3.2.1.6 Performance of primer is noted, that is, whether it fires, misfires, or squibs, and result is recorded. Squibs shall be counted as misfires.

1.3.2.1.7 Ball is removed from ball trap.

1.3.2.1.8 Breech block is unlocked and opened.

1.3.2.1.9 Cartridge case is removed from case holder.

1.3.2.2 The procedure prescribed in 1.3.2.1.2 through 1.3.2.1.9 shall be repeated until the specified number of primed cases have been tested at eight (8) inches. The number of primers firing and the number misfiring shall be recorded.

1.3.2.3 The procedure prescribed in 1.3.2.1 and 1.3.2.2 is then repeated at nine (9) inches, ten (10) inches, etc., until a height is reached at which all the primers in the sample fire. The magnet is then lowered to a height of drop of seven (7) inches, then six (6) inches, etc., until a height is reached at which all the primers in the sample misfire. The number firing and the number misfiring, at each height, shall be recorded.

1.3.2.4 The prescribed procedure constitutes a complete run-down test.

1.3.3 Calculation of Sensitivity Characteristics

The primer sensitivity characteristics to be calculated are "$\bar{H}$", "σ" and "a_3". These three statistics can be defined in terms of the data obtained in the drop test as follows:

a. $\bar{H} = \Sigma p_i + (H_{100\%} + .5)$

b. $\sigma = \sqrt{(\Sigma p_i k_i) - (\Sigma p_i)^2}$

c. $a_3 = \dfrac{\Sigma p_i s_i + 2(\Sigma p_i)^3 - 3\Sigma p_i k_i \Sigma p_i}{\sigma^3}$

Where

$\bar{H}$ = Mean critical height, or the height at which 50 percent of the primers fire and 50 percent of the primers misfire.

Σ = Sum of individual values.

p_i = Decimal fraction of primers misfiring at each individual height.

$H_{100\%}$ = First height at which all primers in sample misfire.

σ = Standard deviation of the critical heights.

k_1 = Variance factor.

s_1 = Skewness factor.

a_3 = Skewness value.

1.3.3.1 The data obtained in the run down tests are tabulated in the manner illustrated on Figure 1.

a. In Column I "Height of Drop", enter all the intermediate heights of drop, in consecutive order, starting with the lowest height at which some of the primers fire and some fail to fire. The height at which all the primers fire and the height at which all the primers misfire are not included.

b. In Column II "Number Fired", enter the number of primers firing at each height.

c. In Column III "Number Misfired", enter the number of primers which fail to fire at each height.

d. In Column IV "Fraction Misfired", enter the decimal fraction of the primers that fail to fire at each intermediate height. This fraction is designated "p_i", and is obtained by dividing the number of primers that fail to fire by the number of primers tested. Results are recorded to the closest second decimal place.

e. Add numbers contained in Column IV and enter sum as Σp_i. Directly under Σp_i enter $H_{100\%} + .5$ (the first height at which all the primers in the sample misfired, plus .50). Add Σp_i, and $H_{100\%} + .5$. The result is $\bar{H}$ (mean critical height).

f. In Column V "Variance Factor", the odd numbers in sequence are written; i.e., 1, 3, 5, 7, 9 etc. Number 1 must be in alignment with the first entry in Column IV.

g. Column VI, the value of the individual entries in Column IV, "p_i" are multiplied by the corresponding individual entries in Column V, "k_i", and the results "p_ik_i" are placed in proper alignment in Column VI. For example, if the number in Column IV is .74 and the odd number aligned with it in Column V is 5, then place 3.70 (5 x .74) in Column VI on the same line as 5 and .74. Odd numbers remaining in Column V having no corresponding entries in Column IV are ignored.

h. Add the numbers contained in Column VI and enter the sum as Σp_ik_i. Directly under Σp_ik_i enter $(\Sigma p_i)^2$, the square of the sum of Column IV. Write $(\Sigma p_i)^2$ to the nearest second decimal place. Subtract $(\Sigma p_i)^2$ from Σp_ik_i. The result is σ^2. Extract the square root of σ^2 to obtain σ, the standard deviation.

1.3.3.2 $\bar{H}$ plus and minus the multiple(s) of σ as prescribed in the applicable specification shall be computed. The results obtained are then compared with the requirements of the specification to determine acceptability.

1.3.3.3 When determination of skewness is required, the following procedure shall be accomplished.

a. Follow procedures prescribed in 1.3.3.1a through 1.3.3.1h.

b. In Column VII "Skewness Factor(s)", the numbers entered are as shown on Figure 1.

c. In Column VIII, numbers as shown in Column VII are multiplied by corresponding numbers in Column IV. Results are placed on same line in Column VIII "p_is_i". Ignore numbers in Column VII that have no corresponding entries in Column IV.

d. Add numbers contained in Column VIII and enter sum as Σp_is_i.

e. Cube the sum of Column IV (Σp_1) and multiply by 2.

f. Multiply the sum of Column VI ($\Sigma p_1 k_1$) by the sum of Column IV (Σp_1), then multiply the product by 3.

g. Cube the standard deviation (σ) obtained in Column VI.

h. Calculate skewness value (a_3) by substitution of computed values in the following formula:

$$a_3 = \frac{\Sigma p_1 s_1 + 2 (\Sigma p_1)^3 - 3 \Sigma p_1 k_1 \Sigma p_1}{\sigma^3}$$

1.4 TEST PROCEDURE (Two Height Test)

To employ this method, it must be assumed that the critical heights of the primers are normally distributed or nearly so. Therefore, this method shall be used only when the criteria prescribed in the applicable specification have been satisfied.

1.4.1 Preparation for test

1.4.1.1 Preparation for test shall be as prescribed in 1.3.1.

1.4.2 Selection of test heights

1.4.2.1 Available run-down test data on the same or similar primers can be utilized to advantage in selecting the heights for a two-height drop test. If such data are not available, the testing of small samples at several heights may be entailed in order to make the proper selection of two test heights. In either case the following criteria apply:

Call the lower height X_1, the upper height X_2, the fraction firing at the lower height p_1, and the fraction firing at the upper height p_2. If at least some failures and non-failures occur at both heights (i.e., neither p_1 nor p_2 are zero (0) or one (1.0) and if $p_2 - p_1 \geq .20$, the heights are considered satisfactory for conducting the two-height test.) If p_1 is zero (0), increase the height and test another sample. If p_2 is one (1.0), decrease the height and test another sample. If $p_2 - p_1 < .20$, increase "d", the difference between the two heights. In addition to the above, it is desirable that X_1 and X_2 be selected so that $p_1 < .50$ and $p_2 > .50$.

1.4.3 Conducting the test

1.4.3.1 Two samples are selected, each containing the number of items prescribed in the applicable specification.

1.4.3.2 Current is applied to the magnet coil to the drop test machine and the magnet height is set so that the distance between bottom of suspended ball and top surface of firing-pin assembly, with primed case in position, is set for the lower height.

1.4.3.3 The procedure prescribed in 1.3.2.1.1 thru 1.3.2.1.9 is then followed until the number specified has been tested at the lower height.

1.4.3.4 The number of primers firing and the fraction thereof shall be recorded on the report form.

1.4.3.5 Following the procedure prescribed in 1.4.3.2 the machine is set for the upper height.

1.4.3.6 The test sample for the upper height is then tested following the procedure prescribed in 1.4.3.3 and 1.4.3.4.

1.5 CALCULATION OF TWO-HEIGHT CHARACTERISTICS

The two-height characteristics to be calculated are "$\bar{H}$" and "σ". These two statistics can be defined in terms of the data obtained in the two-height drop test as follows:

a. $\bar{H} = X_1 + d\ (\bar{H}')$

b. $\sigma = d\ S_1$

Where

$\bar{H}$ = Mean critical height, or the height at which 50 percent of the primers fire and 50 percent of the primers misfire.

σ = Standard deviation of the critical heights.

X_1 = Lower height.

X_2 = Upper height.

= Difference between the fixed heights.

p_1 = Fraction firing at lower height.

p_2 = Fraction firing at upper height.

$\bar{H}'$ & S' = Values obtained from tables at the end of this section.

1.5.1 The data obtained in the two-height test are tabulated in the manner illustrated on Figure 2.

a. In Column I "Height of Drop", enter X_1 (lower height) and X_2 (upper height).

b. In Column II "Number Tested", enter the number of primers tested at each height.

c. In Column III "Number Firing", enter the number of primers firing at each height.

d. In Column IV "Fraction Firing", enter the decimal fraction of the primers that fire at each height. These fractions are designated p_1 and p_2 and are obtained by dividing the number of primers fired at each height. Results are recorded to the nearest second decimal place.

1.5.2 If p_1 is zero (0), the lower height is increased and another test sample selected and tested. If p_2 is one (1.0) the upper height is increased and another test sample selected and tested. If $p_2 - p_1 < .20$, increase "d", the difference between the heights, and test another sample of 20 samples. If $p_2 - p_1 \geq .20$, $p_1 > 0$ and $p_2 < 1.0$, proceed as instructed below:

1.5.3 Using the values of p_1 and p_2 refer to the tables at the end of this section in order to obtain $\bar{H}'$ and S'. The values of $\bar{H}'$ are to be taken as negative for p_1 greater than .50.

1.5.4 Subtract the lower height (X_1) from the upper height (X_2) to obtain the difference, "d".

1.5.5 Compute $\bar{H}$ and σ by substitution of the numerical values for $\bar{H}'$, S', and d in the formulas provided on the Primer Sensitivity Report (Fig. 2).

Example:

a. At 6 inches, 15 out of 50 fired, while at 8 inches, 37 out of 50 fired. Hence, $p_1 = 15/50$ or .30, $p_2 = 37/50$ or .74 and d = 8 - 6 or 2". Since the difference between p_1 and p_2 is at least .20, we can proceed to the tables.

b. Turn to the page that contains $p_1 = .30$. Under column headed p_2 we find .74; on the same line as .74 we find $\bar{H}' = .4491$ and $S' = .8564$.

c. Substitutions in the formulas provided, give the following:

$$\bar{H} = 6 + 2\ (.4491) = 6.90 \text{ inches}$$

$$\sigma = 2\ (.8564) = 1.71 \text{ inches}$$

1.6 RECORDING OF RESULTS

Results shall be recorded as prescribed in 1.3.3 and 1.5.

1.6.1 The following data shall also be recorded:

a. Headspace

b. Firing-pin protrusion

c. Diameter of ball

d. Number tested at each height

SUGGESTED FORMAT

	Engineering Proof Testing Record Primer Sensitivity Test	Ammunition:
[illegible]:		Lot No.
[illegible]type		Ctg. Type
[illegible] Propulsion		Caliber
[illegible] Ball	Spec/Auth	Primer
		Mfg.

[illegible] of primers tested at each height

I Height of Drop "H"	II Number Fired	III Number Misfired	IV Fraction Misfired "p_i"	V Variance Factor "k_i"	VI "$p_i k_i$"	VII Skewness Factor "s_i"	VIII "$p_i s_i$"
				1		1	
				3		7	
				5		19	
				7		37	
				9		61	
				11		91	
				13		127	
				15		169	
				17		217	
				19		271	
				21		331	
				23		397	
				25		469	
				27		547	
		Σp_i		$\Sigma p_i k_i$		$\Sigma p_i s_i$	
		$H_{100\%}+.5$		$-(\Sigma p_i)^2$		$2(\Sigma p_i)^3$	
		$\bar{H}$		σ^2		$3(\Sigma p_i)(\Sigma p_i k_i)$	
				σ		a_3	

$\bar{H} = \Sigma p_i + (H_{100\%} + .5)$

$\sigma = \sqrt{(\Sigma p_i k_i) - (\Sigma p_i)^2}$

$\lambda_3 = \dfrac{\Sigma p_i s_i + 2(\Sigma p_i)^3 - 3\Sigma p_i k_i \Sigma p_i}{\sigma^3}$

Operator:

Date:

Figure 1

SUGGESTED FORMAT

Machine:	Primer Sensitivity Test Two Height Test	Ammunition:
Headspace		Lot No.
F P Protrusion		Ctg Type
Dia. of ball		Caliber
	Spec/Auth	Primer
		Mfg.

I	II	III	IV
Height of Drop	Number Tested	Number Firing	Fraction Firing
X_1 =			P_1 =
X_2 =			P_2 =

$\bar{H} = X_1 + d(A')$

$\sigma = d\,S'$

Operator:

Date:

Figure 2

TABLE I

Estimates of the Mean and Standard Deviation
Fraction Firing at Two Heights

$p_1 = .01$

p_2	$\bar{H}'$	S'	p_2	$\bar{H}'$	S'
[illegible]	1.531	.6579	.61	.8928	.3837
[illegible]	1.497	.6435	.62	.8839	.3799
[illegible]	1.465	.6299	.63	.8751	.3761
[illegible]	1.436	.6173	.64	.8664	.3724
[illegible]	1.408	.6054	.65	.8579	.3687
[illegible]	1.382	.5942	.66	.8493	.3651
[illegible]	1.358	.5836	.67	.8410	.3615
[illegible]	1.334	.5736	.68	.8326	.3579
[illegible]	1.312	.5641	.69	.8243	.3543
[illegible]	1.291	.5550	.70	.8160	.3508
[illegible]1	1.271	.5463	.71	.8078	.3473
[illegible]	1.252	.5380	.72	.7997	.3437
[illegible]	1.233	.5301	.73	.7915	.3402
[illegible]	1.216	.5225	.74	.7834	.3367
[illegible]	1.199	.5152	.75	.7752	.3332
[illegible]	1.182	.5082	.76	.7671	.3298
[illegible]	1.166	.5014	.77	.7590	.3263
[illegible]	1.151	.4949	.78	.7508	.3227
[illegible]	1.136	.4885	.79	.7426	.3192
[illegible]	1.122	.4824	.80	.7343	.3157
.41	1.108	.4765	.81	.7260	.3121
.42	1.095	.4707	.82	.7176	.3085
.43	1.082	.4651	.83	.7091	.3048
[illegible]	1.069	.4597	.84	.7005	.3011
[illegible]	1.057	.4544	.85	.6918	.2974
[illegible]	1.045	.4493	.86	.6829	.2935
.47	1.033	.4443	.87	.6738	.2896
.48	1.022	.4394	.88	.6644	.2856
.49	1.011	.4346	.89	.6548	.2815
.50	1.000	.4299	.90	.6448	.2772
.51	.9893	.4252	.91	.6344	.2727
.52	.9788	.4207	.92	.6234	.2680
.53	.9686	.4163	.93	.6118	.2630
.54	.9586	.4120	.94	.5994	.2577
.55	.9487	.4078	.95	.5858	.2518
.56	.9390	.4036	.96	.5706	.2453
.57	.9295	.3995	.97	.5529	.2377
.58	.9201	.3955	.98	.5311	.2283
.59	.9109	.3915	.99	.5000	.2149
.60	.9018	.3876			

TABLE I (Cont'd)

$p_1 = .02$

p_2	$\bar{H}'$	S'
.22	1.603	.7803
.23	1.562	.7605
.24	1.524	.7422
.25	1.489	.7251
.26	1.456	.7090
.27	1.425	.6940
.28	1.396	.6799
.29	1.369	.6665
.30	1.343	.6539
.31	1.318	.6419
.32	1.295	.6305
.33	1.273	.6197
.34	1.251	.6093
.35	1.231	.5994
.36	1.211	.5899
.37	1.193	.5808
.38	1.175	.5720
.39	1.157	.5636
.40	1.141	.5554
.41	1.125	.5476
.42	1.109	.5400
.43	1.094	.5327
.44	1.079	.5256
.45	1.065	.5187
.46	1.051	.5120
.47	1.038	.5055
.48	1.025	.4991
.49	1.012	.4930
.50	1.000	.4869
.51	.9879	.4810
.52	.9761	.4753
.53	.9646	.4697
.54	.9534	.4642
.55	.9423	.4588
.56	.9315	.4536
.57	.9209	.4484
.58	.9105	.4433
.59	.9003	.4384
.60	.8902	.4335
.61	.8803	.4286
.62	.8705	.4239
.63	.8609	.4192
.64	.8514	.4145
.65	.8420	.4100
.66	.8327	.4055
.67	.8236	.4010
.68	.8145	.3966
.69	.8055	.3922
.70	.7966	.3879
.71	.7877	.3836
.72	.7789	.3793
.73	.7702	.3750
.74	.7615	.3708
.75	.7528	.3665
.76	.7441	.3623
.77	.7354	.3581
.78	.7267	.3539
.79	.7181	.3496
.80	.7093	.3454
.81	.7005	.3411
.82	.6917	.3368
.83	.6828	.3325
.84	.6737	.3281
.85	.6646	.3236
.86	.6553	.3191
.87	.6458	.3145
.88	.6361	.3097
.89	.6261	.3049
.90	.6157	.2998
.91	.6050	.2946
.92	.5938	.2891
.93	.5819	.2833
.94	.5691	.2771
.95	.5553	.2704
.96	.5404	.2631
.97	.5220	.2542
.98	.5000	.2435
.99	.4689	.2283

TABLE I (Cont'd)

$p_1 = .03$

$\bar{H}'$	S'	p_2	$\bar{H}'$	S'
1.[illegible]7	.8757	.63	.8500	.4519
1.501	.8514	.64	.8399	.4466
1.559	.8290	.65	.8300	.4413
1.520	.8081	.66	.8201	.4361
1.483	.7886	.67	.8104	.4309
1.449	.7704	.68	.8009	.4258
1.417	.7534	.69	.7913	.4208
1.387	.7372	.70	.7820	.4158
1.358	.7221	.71	.7727	.4108
1.331	.7077	.72	.7634	.4059
1.305	.6940	.73	.7543	.4010
1.281	.6811	.74	.7451	.3962
1.259	.6687	.75	.7360	.3913
1.235	.6569	.76	.7270	.3865
1.214	.6456	.77	.7180	.3817
1.194	.6348	.78	.7089	.3769
1.174	.6244	.79	.6999	.3721
1.156	.6144	.80	.6909	.3673
1.138	.6049	.81	.6818	.3625
1.120	.5956	.82	.6726	.3576
1.103	.5867	.83	.6634	.3527
1.087	.5781	.84	.6541	.3478
1.072	.5698	.85	.6447	.3428
1.056	.5617	.86	.6352	.3377
1.042	.5539	.87	.6254	.3325
1.027	.5463	.88	.6155	.3272
1.014	.5389	.89	.6053	.3218
1.000	.5317	.90	.5947	.3162
.9868	.5247	.91	.5838	.3104
.9740	.5179	.92	.5724	.3043
.9615	.5112	.93	.5603	.2979
.9493	.5047	.94	.5474	.2911
.9374	.4984	.95	.5335	.2836
.9257	.4922	.96	.5179	.2754
.9143	.4861	.97	.5000	.2658
.9031	.4801	.98	.4780	.2542
.8921	.4743	.99	.4471	.2377
.8813	.4686			
.8707	.4629			
.8603	.4574			

TABLE I (Cont'd)

$p_1 = .04$

p_2	$\bar{H}'$	S'	p_2	$\bar{H}'$	S'
.24	1.676	.9575	.64	.8300	.4741
.25	1.627	.9292	.65	.8196	.4682
.26	1.581	.9030	.66	.8093	.4623
.27	1.539	.8788	.67	.7992	.4565
.28	1.499	.8562	.68	.7892	.4508
.29	1.462	.8352	.69	.7793	.4451
.30	1.428	.8155	.70	.7695	.4395
.31	1.395	.7969	.71	.7598	.4340
.32	1.365	.7794	.72	.7502	.4285
.33	1.336	.7629	.73	.7407	.4231
.34	1.308	.7473	.74	.7313	.4177
.35	1.282	.7324	.75	.7219	.4123
.36	1.258	.7183	.76	.7125	.4070
.37	1.234	.7048	.77	.7032	.4017
.38	1.211	.6919	.78	.6939	.3964
.39	1.190	.6796	.79	.6846	.3911
.40	1.169	.6678	.80	.6753	.3858
.41	1.149	.6565	.81	.6660	.3804
.42	1.130	.6457	.82	.6567	.3751
.43	1.112	.6352	.83	.6472	.3697
.44	1.094	.6251	.84	.6377	.3643
.45	1.077	.6154	.85	.6281	.3588
.46	1.061	.6060	.86	.6184	.3532
.47	1.045	.5969	.87	.6085	.3476
.48	1.030	.5881	.88	.5984	.3418
.49	1.015	.5795	.89	.5880	.3359
.50	1.000	.5712	.90	.5774	.3298
.51	.9859	.5631	.91	.5663	.3235
.52	.9721	.5553	.92	.5548	.3169
.53	.9588	.5476	.93	.5426	.3099
.54	.9458	.5402	.94	.5296	.3025
.55	.9330	.5329	.95	.5156	.2945
.56	.9206	.5258	.96	.5000	.2856
.57	.9085	.5189	.97	.4821	.2754
.58	.8966	.5121	.98	.4602	.2629
.59	.8850	.5055	.99	.4294	.2453
.60	.8736	.4990			
.61	.8624	.4926			
.62	.8514	.4863			
.63	.8406	.4802			

TABLE I (Cont'd)

$p_1 = .05$

	$\bar{H}'$	S'	P_2	$\bar{H}'$	S'
	1.695	1.031	.65	.8102	.4926
	1.642	.9984	.66	.7995	.4861
	1.594	.9689	.67	.7890	.4797
	1.549	.9415	.68	.7786	.4734
	1.507	.9162	.69	.7684	.4671
	1.468	.8925	.70	.7583	.4610
	1.432	.8703	.71	.7483	.4549
	1.397	.8495	.72	.7384	.4489
	1.365	.8299	.73	.7286	.4429
	1.335	.8114	.74	.7189	.4370
	1.305	.7939	.75	.7092	.4311
	1.279	.7774	.76	.6996	.4253
	1.253	.7616	.77	.6901	.4195
	1.228	.7466	.78	.6805	.4137
	1.205	.7323	.79	.6710	.4079
	1.182	.7186	.80	.6615	.4022
	1.161	.7055	.81	.6520	.3964
	1.140	.6930	.82	.6425	.3906
	1.120	.6810	.83	.6329	.3847
	1.101	.6694	.84	.6232	.3789
	1.083	.6582	.85	.6135	.3730
	1.065	.6475	.86	.6036	.3669
	1.048	.6371	.87	.5935	.3608
	1.031	.6271	.88	.5833	.3546
	1.015	.6174	.89	.5729	.3483
	1.000	.6079	.90	.5621	.3417
	.9850	.5988	.91	.5509	.3349
	.9704	.5899	.92	.5393	.3279
	.9562	.5813	.93	.5271	.3204
	.9425	.5730	.94	.5141	.3125
	.9290	.5648	.95	.5000	.3040
	.9159	.5568	.96	.4844	.2945
	.9031	.5490	.97	.4665	.2836
	.8907	.5415	.98	.4447	.2704
	.8785	.5341	.99	.4142	.2518
	.8666	.5268			
	.8548	.5197			
	.8434	.5127			
	.8321	.5059			
	.8211	.4992			

TABLE I (Cont'd)

$p_1 = .06$

p_2	$\bar{H}'$	S'	p_2	$\bar{H}'$	S'
.26	1.706	1.097	.66	.7903	.5083
.27	1.651	1.062	.67	.7795	.5013
.28	1.600	1.029	.68	.7688	.4944
.29	1.553	.9986	.69	.7582	.4876
.30	1.509	.9705	.70	.7478	.4810
.31	1.468	.9444	.71	.7375	.4743
.32	1.430	.9199	.72	.7274	.4678
.33	1.395	.8969	.73	.7173	.4613
.34	1.361	.8754	.74	.7073	.4549
.35	1.329	.8551	.75	.6974	.4486
.36	1.300	.8359	.76	.6876	.4423
.37	1.271	.8177	.77	.6779	.4360
.38	1.245	.8004	.78	.6682	.4297
.39	1.219	.7840	.79	.6585	.4235
.40	1.195	.7683	.80	.6488	.4173
.41	1.171	.7534	.81	.6391	.4111
.42	1.149	.7392	.82	.6294	.4048
.43	1.128	.7255	.83	.6197	.3986
.44	1.108	.7124	.84	.6099	.3923
.45	1.088	.6997	.85	.6000	.3859
.46	1.069	.6876	.86	.5900	.3795
.47	1.051	.6759	.87	.5799	.3730
.48	1.033	.6646	.88	.5696	.3663
.49	1.016	.6537	.89	.5590	.3595
.50	1.000	.6432	.90	.5482	.3526
.51	.9841	.6330	.91	.5370	.3454
.52	.9687	.6231	.92	.5253	.3378
.53	.9538	.6135	.93	.5130	.3300
.54	.9393	.6042	.94	.5000	.3216
.55	.9252	.5951	.95	.4859	.3125
.56	.9115	.5862	.96	.4704	.3025
.57	.8981	.5776	.97	.4526	.2911
.58	.8851	.5692	.98	.4309	.2771
.59	.8724	.5611	.99	.4006	.257
.60	.8599	.5531			
.61	.8477	.5452			
.62	.8358	.5375			
.63	.8241	.5300			
.64	.8126	.5227			
.65	.8014	.5154			

TABLE I (Cont'd)

$p_1 = .07$

p_2	$\bar{H}'$	S'
[illegible]	1.710	1.159
[illegible]	1.653	1.120
[illegible]	1.600	1.084
[illegible]	1.551	1.051
[illegible]	1.506	1.021
[illegible]	1.464	.9920
[illegible]	1.425	.9653
[illegible]	1.389	.9405
[illegible]	1.353	.9170
[illegible]	1.321	.8950
[illegible]	1.290	.8742
[illegible]	1.261	.8545
[illegible]	1.233	.8358
[illegible]	1.207	.8180
[illegible]	1.182	.8011
[illegible]	1.158	.7850
[illegible]	1.136	.7696
[illegible]	1.114	.7548
[illegible]	1.093	.7407
[illegible]	1.073	.7271
[illegible]	1.054	.7140
[illegible]	1.035	.7015
[illegible]	1.017	.6893
[illegible]	1.000	.6776
.51	.9833	.6663
.52	.9671	.6553
.53	.9515	.6447
.54	.9363	.6344
.55	.9215	.6244
.56	.9072	.6147
.57	.8932	.6053
.58	.8797	.5961
.59	.8664	.5871
.60	.8535	.5783
.61	.8409	.5698
.62	.8285	.5614
.63	.8164	.5532
.64	.8046	.5452
.65	.7930	.5373
.66	.7815	.5296
.67	.7704	.5220
.68	.7594	.5145
.69	.7485	.5072
.70	.7378	.5000
.71	.7273	.4928
.72	.7169	.4858
.73	.7066	.4788
.74	.6964	.4719
.75	.6863	.4651
.76	.6763	.4583
.77	.6664	.4515
.78	.6565	.4448
.79	.6467	.4382
.80	.6368	.4315
.81	.6270	.4249
.82	.6172	.4182
.83	.6073	.4115
.84	.5974	.4048
.85	.5875	.3981
.86	.5774	.3912
.87	.5671	.3843
.88	.5567	.3772
.89	.5461	.3701
.90	.5352	.3627
.91	.5240	.3550
.92	.5123	.3471
.93	.5000	.3388
.94	.4870	.3300
.95	.4729	.3204
.96	.4574	.3099
.97	.4397	.2979
.98	.4181	.2833
.99	.3882	.2630

TABLE I (Cont'd)

$p_1 = .08$

p_2	$\bar{H}'$	S'	p_2	$\bar{H}'$	S'
.28	1.709	1.216	.64	.7967	.5670
.29	1.650	1.174	.65	.7848	.5585
.30	1.595	1.135	.66	.7731	.5502
.31	1.545	1.100	.67	.7616	.5420
.32	1.499	1.067	.68	.7503	.5340
.33	1.456	1.036	.69	.7391	.5260
.34	1.416	1.007	.70	.7282	.5183
.35	1.378	.9806	.71	.7174	.5106
.36	1.343	.9555	.72	.7068	.5030
.37	1.309	.9318	.73	.6963	.4956
.38	1.278	.9094	.74	.6860	.4882
.39	1.248	.8883	.75	.6757	.4809
.40	1.220	.8682	.76	.6655	.4736
.41	1.193	.8492	.77	.6554	.4664
.42	1.168	.8311	.78	.6453	.4593
.43	1.144	.8139	.79	.6354	.4522
.44	1.120	.7974	.80	.6254	.4451
.45	1.098	.7816	.81	.6155	.4380
.46	1.077	.7665	.82	.6055	.4309
.47	1.057	.7520	.83	.5956	.4239
.48	1.037	.7381	.84	.5856	.4167
.49	1.018	.7246	.85	.5755	.4096
.50	1.000	.7117	.86	.5653	.4023
.51	.9825	.6992	.87	.5550	.3950
.52	.9655	.6871	.88	.5446	.3876
.53	.9491	.6755	.89	.5339	.3800
.54	.9333	.6642	.90	.5230	.3722
.55	.9179	.6533	.91	.5117	.3642
.56	.9030	.6426	.92	.5000	.3558
.57	.8885	.6323	.93	.4877	.3471
.58	.8744	.6223	.94	.4747	.3378
.59	.8607	.6125	.95	.4607	.3279
.60	.8473	.6030	.96	.4452	.3169
.61	.8342	.5937	.97	.4276	.3043
.62	.8214	.5846	.98	.4062	.2891
.63	.8089	.5757	.99	.3766	.2680

TABLE I (Cont'd)

$p_1 = .10$

p_2	$\overline{H}'$	S'	p_2	$\overline{H}'$	S'
.30	1.693	1.321	.66	.7565	.5903
.31	1.631	1.273	.67	.7445	.5809
.32	1.575	1.229	.68	.7326	.5717
.33	1.523	1.188	.69	.7210	.5626
.34	1.475	1.151	.70	.7096	.5537
.35	1.430	1.116	.71	.6984	.5450
.36	1.388	1.083	.72	.6874	.5364
.37	1.349	1.053	.73	.6765	.5279
.38	1.313	1.024	.74	.6658	.5195
.39	1.279	.9977	.75	.6552	.5112
.40	1.246	.9725	.76	.6447	.5030
.41	1.216	.9487	.77	.6343	.4950
.42	1.187	.9262	.78	.6240	.4869
.43	1.160	.9048	.79	.6138	.4789
.44	1.134	.8845	.80	.6036	.4710
.45	1.109	.8651	.81	.5935	.4631
.46	1.085	.8466	.82	.5833	.4552
.47	1.062	.8290	.83	.5732	.4473
.48	1.041	.8121	.84	.5631	.4393
.49	1.020	.7959	.85	.5529	.4314
.50	1.000	.7803	.86	.5426	.4234
.51	.9808	.7653	.87	.5322	.4153
.52	.9623	.7509	.88	.5217	.4071
.53	.9445	.7370	.89	.5118	.3987
.54	.9274	.7236	.90	.5000	.3901
.55	.9107	.7106	.91	.4887	.3813
.56	.8946	.6980	.92	.4770	.3722
.57	.8790	.6859	.93	.4648	.3627
.58	.8639	.6741	.94	.4518	.3526
.59	.8492	.6626	.95	.4379	.3417
.60	.8350	.6515	.96	.4226	.3298
.61	.8211	.6407	.97	.4053	.3162
.62	.8075	.6301	.98	.3843	.2998
.63	.7943	.6198	.99	.3552	.2772
.64	.7814	.6097			
.65	.7689	.5999			

TABLE I (Cont'd)

$p_1 = .11$

p_2	$\bar{H}'$	S'	p_2	$\bar{H}'$	S'
.31	1.679	1.369	.67	.7360	.6001
.32	1.616	1.318	.68	.7239	.5902
.33	1.559	1.271	.69	.7121	.5806
.34	1.507	1.229	.70	.7005	.5711
.35	1.458	1.189	.71	.6891	.5618
.36	1.413	1.152	.72	.6779	.5527
.37	1.371	1.118	.73	.6668	.5437
.38	1.332	1.086	.74	.6560	.5348
.39	1.295	1.056	.75	.6452	.5260
.40	1.260	1.028	.76	.6346	.5174
.41	1.228	1.001	.77	.6241	.5088
.42	1.197	.9760	.78	.6136	.5003
.43	1.168	.9523	.79	.6033	.4919
.44	1.140	.9298	.80	.5931	.4835
.45	1.114	.9084	.81	.5828	.4752
.46	1.089	.8880	.82	.5726	.4669
.47	1.065	.8687	.83	.5624	.4586
.48	1.043	.8501	.84	.5522	.4502
.49	1.021	.8324	.85	.5420	.4419
.50	1.000	.8153	.86	.5317	.4335
.51	.9799	.7990	.87	.5213	.4250
.52	.9607	.7833	.88	.5107	.4164
.53	.9422	.7682	.89	.5000	.4077
.54	.9243	.7536	.90	.4890	.3987
.55	.9070	.7395	.91	.4777	.3895
.56	.8904	.7260	.92	.4661	.3800
.57	.8743	.7128	.93	.4539	.3701
.58	.8587	.7001	.94	.4410	.3595
.59	.8435	.6878	.95	.4271	.3483
.60	.8288	.6758	.96	.4120	.3359
.61	.8145	.6641	.97	.3947	.3218
.62	.8006	.6527	.98	.3739	.3049
.63	.7870	.6417	.99	.3452	.2815
.64	.7738	.6309			
.65	.7610	.6204			
.66	.7483	.6101			

TABLE I (Cont'd)

$p_1 = .12$

p_2	$\bar{H}'$	S'	p_2	$\bar{H}'$	S'
.32	1.661	1.414	.68	.7153	.6088
.33	1.598	1.360	.69	.7032	.5985
.34	1.541	1.311	.70	.6914	.5884
.35	1.488	1.266	.71	.6789	.5786
.36	1.439	1.225	.72	.6684	.5689
.37	1.394	1.186	.73	.6572	.5593
.38	1.351	1.150	.74	.6462	.5500
.39	1.312	1.116	.75	.6353	.5407
.40	1.275	1.085	.76	.6246	.5315
.41	1.240	1.055	.77	.6140	.5225
.42	1.207	1.028	.78	.6034	.5136
.43	1.177	1.001	.79	.5930	.5047
.44	1.147	.9766	.80	.5827	.4959
.45	1.120	.9530	.81	.5724	.4871
.46	1.093	.9306	.82	.5621	.4784
.47	1.068	.9093	.83	.5519	.4697
.48	1.045	.8890	.84	.5416	.4609
.49	1.022	.8696	.85	.5313	.4522
.50	1.000	.8511	.86	.5210	.4434
.51	.9791	.8333	.87	.5106	.4345
.52	.9590	.8162	.88	.5000	.4255
.53	.9397	.7998	.89	.4893	.4164
.54	.9213	.7841	.90	.4783	.4071
.55	.9034	.7688	.91	.4670	.3975
.56	.8861	.7541	.92	.4554	.3876
.57	.8695	.7400	.93	.4433	.3772
.58	.8534	.7263	.94	.4304	.3663
.59	.8378	.7130	.95	.4167	.3546
.60	.8227	.7001	.96	.4016	.3418
.61	.8079	.6876	.97	.3845	.3272
.62	.7937	.6754	.98	.3639	.3097
.63	.7797	.6636	.99	.3356	.2856
.64	.7662	.6521			
.65	.7531	.6409			
.66	.7402	.6299			
.67	.7276	.6192			

TABLE I (Cont'd)

$p_1 = .13$

	$\bar{H}'$	S'	p_2	$\bar{H}'$	S'
	1.641	1.457	.69	.6943	.6164
	1.578	1.401	.70	.6823	.6058
	1.520	1.349	.71	.6706	.5953
	1.467	1.302	.72	.6590	.5851
	1.418	1.259	.73	.6477	.5750
	1.372	1.218	.74	.6365	.5651
	1.330	1.180	.75	.6255	.5553
	1.290	1.145	.76	.6146	.5456
	1.253	1.112	.77	.6039	.5361
	1.218	1.082	.78	.5933	.5267
	1.186	1.053	.79	.5828	.5174
	1.155	1.025	.80	.5724	.5081
	1.126	.9993	.81	.5620	.4989
	1.098	.9747	.82	.5517	.4898
	1.072	.9514	.83	.5414	.4806
	1.047	.9292	.84	.5311	.4715
	1.023	.9080	.85	.5208	.4624
	1.000	.8878	.86	.5104	.4532
	.9782	.8684	.87	.5000	.4439
	.9573	.8499	.88	.4894	.4345
	.9373	.8322	.89	.4787	.4250
	.9182	.8151	.90	.4678	.4153
	.8996	.7987	.91	.4565	.4053
	.8818	.7828	.92	.4450	.3950
	.8646	.7676	.93	.4329	.3843
	.8480	.7528	.94	.4201	.3730
	.8320	.7386	.95	.4065	.3608
	.8164	.7248	.96	.3915	.3476
		.7114	.97	.3746	.3325
		.6984	.98	.3542	.3145
		.6857	.99	.3262	.2896
		.6734			
		.6615			
		.6498			
		.6384			
		.6273			

TABLE I (Cont'd)

$p_1 = .14$

p_2	$\bar{H}'$	S'	p_2	$\bar{H}'$	S'
.34	1.618	1.4975	.70	.6732	.6232
.35	1.554	1.4388	.71	.6613	.6121
.36	1.497	1.3854	.72	.6496	.6013
.37	1.444	1.3362	.73	.6381	.5906
.38	1.394	1.2907	.74	.6268	.5802
.39	1.349	1.2484	.75	.6156	.5699
.40	1.306	1.2092	.76	.6047	.5597
.41	1.267	1.1726	.77	.5939	.5497
.42	1.230	1.1384	.78	.5832	.5398
.43	1.195	1.1063	.79	.5726	.5300
.44	1.163	1.0761	.80	.5621	.5203
.45	1.132	1.0476	.81	.5517	.5107
.46	1.103	1.0205	.82	.5413	.5011
.47	1.075	.9950	.83	.5310	.4915
.48	1.049	.9708	.84	.5207	.4820
.49	1.024	.9477	.85	.5104	.4724
.50	1.000	.9257	.86	.5000	.4628
.51	.9773	.9046	.87	.4896	.4532
.52	.9556	.8846	.88	.4790	.4434
.53	.9348	.8653	.89	.4683	.4335
.54	.9150	.8470	.90	.4574	.4234
.55	.8958	.8292	.91	.4462	.4130
.56	.8774	.8121	.92	.4347	.4023
.57	.8596	.7957	.93	.4226	.3912
.58	.8425	.7799	.94	.4100	.3795
.59	.8260	.7646	.95	.3964	.3669
.60	.8101	.7499	.96	.3816	.3532
.61	.7946	.7355	.97	.3648	.3377
.62	.7795	.7216	.98	.3447	.3191
.63	.7650	.7081	.99	.3171	.2935
.64	.7508	.6950			
.65	.7371	.6823			
.66	.7237	.6699			
.67	.7106	.6578			
.68	.6979	.6460			
.69	.6854	.6344			

TABLE I (Cont'd)

$p_1 = .15$

p_2	$\bar{H}'$	S'	p_2	$\bar{H}'$	S'
.[illegible]	1.592	1.536	.67	.7020	.6774
.[illegible]	1.529	1.475	.68	.6890	.6648
.[illegible]	1.471	1.419	.69	.6764	.6526
.[illegible]	1.418	1.368	.70	.6640	.6407
.39	1.369	1.321	.71	.6519	.6290
.40	1.323	1.277	.72	.6401	.6176
.41	1.281	1.236	.73	.6284	.6064
.42	1.242	1.198	.74	.6170	.5953
.43	1.205	1.163	.75	.6058	.5845
.44	1.171	1.129	.76	.5947	.5738
.45	1.138	1.098	.77	.5838	.5633
.46	1.107	1.068	.78	.5730	.5529
.47	1.078	1.040	.79	.5624	.5427
.48	1.051	1.014	.80	.5519	.5325
.49	1.025	.9888	.81	.5414	.5224
.50	1.000	.9649	.82	.5310	.5123
.51	.9764	.9421	.83	.5211	.5024
.52	.9538	.9203	.84	.5103	.4924
.53	.9323	.8995	.85	.5000	.4824
.54	.9117	.8797	.86	.4896	.4724
.55	.8918	.8605	.87	.4792	.4624
.56	.8728	.8422	.88	.4687	.4522
.57	.8546	.8245	.89	.4580	.4419
.58	.8370	.8076	.90	.4471	.4314
.59	.8200	.7912	.91	.4360	.4207
.60	.8036	.7754	.92	.4245	.4098
.61	.7877	.7601	.93	.4125	.3981
.62	.7723	.7452	.94	.4000	.3859
.63	.7574	.7308	.95	.3865	.3730
.64	.7430	.7169	.96	.3719	.3588
.65	.7290	.7034	.97	.3553	.3428
.66	.7153	.6902	.98	.3354	.3236
			.99	.3082	.2974

TABLE I (Cont'd)

$p_1 = .16$

p_2	$\bar{H}'$	S'	p_2	$\bar{H}'$	S'
.36	1.564	1.572	.68	.6801	.6839
.37	1.501	1.509	.69	.6673	.6710
.38	1.443	1.451	.70	.6548	.6584
.39	1.391	1.398	.71	.6425	.6460
.40	1.342	1.349	.72	.6305	.6340
.41	1.297	1.304	.73	.6187	.6222
.42	1.255	1.262	.74	.6072	.6106
.43	1.216	1.222	.75	.5959	.5992
.44	1.179	1.186	.76	.5847	.5880
.45	1.145	1.151	.77	.5738	.5769
.46	1.112	1.118	.78	.5629	.5660
.47	1.082	1.088	.79	.5522	.5553
.48	1.053	1.059	.80	.5416	.5446
.49	1.026	1.032	.81	.5311	.5341
.50	1.000	1.006	.82	.5207	.5236
.51	.9754	.9808	.83	.5103	.5132
.52	.9519	.9572	.84	.5000	.5028
.53	.9296	.9348	.85	.4897	.4924
.54	.9083	.9133	.86	.4793	.4820
.55	.8878	.8927	.87	.4689	.4715
.56	.8682	.8730	.88	.4584	.4609
.57	.8493	.8540	.89	.4478	.4502
.58	.8312	.8358	.90	.4369	.4393
.59	.8138	.8183	.91	.4259	.4282
.60	.7970	.8014	.92	.4144	.4167
.61	.7807	.7851	.93	.4026	.4048
.62	.7650	.7692	.94	.3901	.3923
.63	.7503	.7545	.95	.3768	.3789
.64	.7350	.7391	.96	.3623	.3643
.65	.7208	.7247	.97	.3459	.3478
.66	.7068	.7107	.98	.3263	.3281
.67	.6933	.6972	.99	.2995	.3011

TABLE I (Cont'd)

$p_1 = .17$

p_2	$\bar{H}'$	S'	p_2	$\bar{H}'$	S'
.37	1.533	1.607	.69	.6580	.6896
.38	1.471	1.542	.70	.6453	.6763
.39	1.414	1.482	.71	.6329	.6633
.40	1.361	1.427	.72	.6208	.6506
.41	1.313	1.376	.73	.6089	.6382
.42	1.268	1.329	.74	.5973	.6260
.43	1.227	1.286	.75	.5859	.6140
.44	1.188	1.245	.76	.5746	.6022
.45	1.152	1.207	.77	.5636	.5907
.46	1.118	1.171	.78	.5527	.5792
.47	1.086	1.138	.79	.5420	.5680
.48	1.056	1.106	.80	.5314	.5568
.49	1.027	1.076	.81	.5208	.5458
.50	1.000	1.048	.82	.5104	.5349
.51	.9744	1.021	.83	.5000	.5240
.52	.9500	.9956	.84	.4896	.5132
.53	.9269	.9713	.85	.4794	.5024
.54	.9048	.9482	.86	.4690	.4915
.55	.8836	.9260	.87	.4586	.4806
.56	.8634	.9048	.88	.4481	.4696
.57	.8440	.8845	.89	.4376	.4586
.58	.8254	.8650	.90	.4268	.4473
.59	.8075	.8462	.91	.4158	.4357
.60	.7902	.8282	.92	.4044	.4238
.61	.7736	.8107	.93	.3927	.4115
.62	.7575	.7938	.94	.3803	.3986
.63	.7419	.7775	.95	.3671	.3847
.64	.7269	.7618	.96	.3528	.3697
.65	.7124	.7465	.97	.3366	.3527
.66	.6982	.7317	.98	.3172	.3324
.67	.6845	.7173	.99	.2909	.3048
.68	.6711	.7033			

TABLE I (Cont'd)

$p_1 = .18$

p_2	$\overline{H}'$	S'	p_2	$\overline{H}'$	S'
.38	1.501	1.640	.70	.6358	.6945
.39	1.439	1.572	.71	.6232	.6808
.40	1.382	1.510	.72	.6110	.6675
.41	1.331	1.454	.73	.5990	.6544
.42	1.283	1.402	.74	.5873	.6416
.43	1.239	1.353	.75	.5758	.6290
.44	1.198	1.308	.76	.5645	.6166
.45	1.159	1.266	.77	.5534	.6045
.46	1.123	1.227	.78	.5424	.5926
.47	1.090	1.190	.79	.5317	.5808
.48	1.058	1.156	.80	.5210	.5692
.49	1.028	1.123	.81	.5105	.5576
.50	1.000	1.092	.82	.5000	.5462
.51	.9733	1.063	.83	.4896	.5349
.52	.9480	1.036	.84	.4793	.5236
.53	.9240	1.009	.85	.4690	.5123
.54	.9012	.9844	.86	.4587	.5011
.55	.8793	.9605	.87	.4483	.4898
.56	.8584	.9377	.88	.4379	.4784
.57	.8384	.9159	.89	.4274	.4669
.58	.8193	.8950	.90	.4167	.4552
.59	.8009	.8750	.91	.4057	.4432
.60	.7833	.8556	.92	.3945	.4309
.61	.7662	.8370	.93	.3828	.4182
.62	.7498	.8191	.94	.3706	.4048
.63	.7339	.8017	.95	.3575	.3906
.64	.7186	.7850	.96	.3433	.3751
.65	.7038	.7688	.97	.3274	.3576
.66	.6894	.7531	.98	.3083	.3368
.67	.6756	.7378	.99	.2824	.3085
.68	.6618	.7230			
.69	.6486	.7086			

TABLE I (Cont'd)

$p_1 = .19$

p_2	$\bar{H}'$	S'	p_2	$\bar{H}'$	S'
.39	1.466	1.670	.71	.6134	.6987
.40	1.406	1.601	.72	.6010	.6846
.41	1.350	1.538	.73	.5889	.6708
.42	1.299	1.479	.74	.5771	.6574
.43	1.251	1.426	.75	.5655	.6442
.44	1.208	1.376	.76	.5542	.6312
.45	1.167	1.329	.77	.5430	.6185
.46	1.129	1.286	.78	.5320	.6060
.47	1.094	1.246	.79	.5212	.5937
.48	1.061	1.208	.80	.5106	.5816
.49	1.029	1.173	.81	.5000	.5695
.50	1.000	1.139	.82	.4895	.5576
.51	.9722	1.107	.83	.4792	.5458
.52	.9459	1.077	.84	.4689	.5341
.53	.9210	1.049	.85	.4586	.5224
.54	.8974	1.022	.86	.4483	.5107
.55	.8748	.9964	.87	.4380	.4989
.56	.8532	.9719	.88	.4276	.4871
.57	.8327	.9485	.89	.4172	.4752
.58	.8130	.9261	.90	.4065	.4631
.59	.7942	.9046	.91	.3957	.4507
.60	.7761	.8840	.92	.3845	.4380
.61	.7586	.8642	.93	.3730	.4249
.62	.7418	.8450	.94	.3609	.4111
.63	.7256	.8266	.95	.3480	.3964
.64	.7100	.8088	.96	.3340	.3804
.65	.6950	.7916	.97	.3182	.3625
.66	.6803	.7750	.98	.2295	.3411
.67	.6662	.7588	.99	.2740	.3121
.68	.6524	.7432			
.69	.6390	.7279			
.70	.6260	.7131			

TABLE I (Cont'd)

$p_1 = .20$

p_2	$\bar{H}'$	S'	p_2	$\bar{H}'$	S'
.40	1.431	1.700	.72	.5908	.7020
.41	1.370	1.628	.73	.5787	.6876
.42	1.316	1.563	.74	.5668	.6734
.43	1.265	1.503	.75	.5551	.6596
.44	1.219	1.448	.76	.5437	.6460
.45	1.176	1.397	.77	.5325	.6328
.46	1.135	1.349	.78	.5215	.6197
.47	1.098	1.305	.79	.5107	.6068
.48	1.063	1.264	.80	.5000	.5941
.49	1.031	1.225	.81	.4894	.5816
.50	1.000	1.188	.82	.4790	.5692
.51	.9710	1.154	.83	.4686	.5569
.52	.9437	1.121	.84	.4584	.5446
.53	.9179	1.091	.85	.4481	.5325
.54	.8934	1.062	.86	.4379	.5203
.55	.8701	1.034	.87	.4276	.5081
.56	.8479	1.007	.88	.4173	.4959
.57	.8267	.9823	.89	.4069	.4835
.58	.8065	.9583	.90	.3964	.4710
.59	.7872	.9354	.91	.3856	.4582
.60	.7687	.9133	.92	.3746	.4451
.61	.7508	.8921	.93	.3632	.4315
.62	.7337	.8718	.94	.3512	.4173
.63	.7172	.8522	.95	.3385	.4022
.64	.7013	.8333	.96	.3247	.3858
.65	.6860	.8151	.97	.3091	.3673
.66	.6711	.7974	.98	.2907	.3454
.67	.6567	.7803	.99	.2657	.3157
.68	.6428	.7638			
.69	.6292	.7477			
.70	.6161	.7321			
.71	.6033	.7168			

TABLE I (Cont'd)

$p_1 = .21$

p_2	$\bar{H}'$	S'	p_2	$\bar{H}'$	S'
.[illegible]1	1.393	1.727	.73	.5682	.7046
.[illegible]	1.334	1.654	.74	.5563	.6898
.[illegible]	1.280	1.587	.75	.5445	.6753
.[illegible]	1.230	1.526	.76	.5331	.6611
.[illegible]	1.185	1.469	.77	.5219	.6472
.[illegible]	1.142	1.416	.78	.5108	.6335
.[illegible]	1.103	1.368	.79	.5000	.6200
.[illegible]	1.066	1.322	.80	.4893	.6068
.[illegible]	1.032	1.280	.81	.4788	.5937
.[illegible]	1.000	1.240	.82	.4683	.5808
.[illegible]1	.9698	1.203	.83	.4580	.5680
.[illegible]	.9414	1.167	.84	.4478	.5553
.[illegible]	.9146	1.134	.85	.4376	.5426
.[illegible]	.8893	1.103	.86	.4274	.5300
.[illegible]	.8651	1.073	.87	.4172	.5174
.[illegible]	.8423	1.044	.88	.4070	.5047
.[illegible]	.8205	1.018	.89	.3967	.4919
.[illegible]	.7998	.9918	.90	.3862	.4789
.[illegible]	.7800	.9672	.91	.3756	.4657
.60	.7610	.9437	.92	.3646	.4522
.61	.7427	.9211	.93	.3533	.4382
.62	.7252	.8994	.94	.3415	.4235
.63	.7084	.8785	.95	.3290	.4079
.64	.6922	.8584	.96	.3154	.3911
.65	.6767	.8391	.97	.3001	.3721
.66	.6616	.8204	.98	.2819	.3496
.67	.6470	.8024	.99	.2574	.3192
.68	.6329	.7849			
.69	.6192	.7679			
.70	.6060	.7514			
.71	.5930	.7354			
.72	.5805	.7198			

TABLE I (Cont'd)

$p_1 = .22$

p_2	$\bar{H}'$	S'	p_2	$\bar{H}'$	S'
.42	1.354	1.753	.74	.5455	.7065
.43	1.296	1.678	.75	.5338	.6912
.44	1.243	1.610	.76	.5223	.6764
.45	1.194	1.547	.77	.5111	.6618
.46	1.149	1.489	.78	.5000	.6475
.47	1.108	1.435	.79	.4892	.6335
.48	1.070	1.385	.80	.4785	.6197
.49	1.034	1.339	.81	.4680	.6060
.50	1.000	1.295	.82	.4576	.5926
.51	.9685	1.254	.83	.4473	.5792
.52	.9390	1.216	.84	.4371	.5660
.53	.9112	1.180	.85	.4270	.5529
.54	.8849	1.146	.86	.4168	.5398
.55	.8600	1.114	.87	.4067	.5267
.56	.8364	1.083	.88	.3966	.5136
.57	.8140	1.054	.89	.3864	.5003
.58	.7927	1.027	.90	.3760	.4869
.59	.7724	1.000	.91	.3655	.4733
.60	.7530	.9751	.92	.3547	.4593
.61	.7344	.9510	.93	.3435	.4448
.62	.7165	.9279	.94	.3318	.4297
.63	.6994	.9057	.95	.3195	.4137
.64	.6829	.8844	.96	.3061	.3964
.65	.6671	.8639	.97	.2911	.3769
.66	.6518	.8441	.98	.2733	.3539
.67	.6371	.8250	.99	.2492	.3227
.68	.6228	.8065			
.69	.6089	.7886			
.70	.5956	.7712			
.71	.5825	.7544			
.72	.5699	.7380			
.73	.5575	.7220			

TABLE I (Cont'd)

$p_1 = .23$

p_2	$\bar{H}'$	S'	p_2	H'	S'
.43	1.314	1.778	.71	.5717	.7739
.44	1.257	1.701	.72	.5590	.7567
.45	1.205	1.631	.73	.5466	.7399
.46	1.157	1.566	.74	.5345	.7235
.47	1.113	1.507	.75	.5227	.7076
.48	1.073	1.452	.76	.5112	.6920
.49	1.035	1.401	.77	.5000	.6768
.50	1.000	1.354	.78	.4889	.6618
.51	.9671	1.309	.79	.4781	.6472
.52	.9364	1.267	.80	.4675	.6328
.53	.9075	1.228	.81	.4570	.6185
.54	.8804	1.192	.82	.4466	.6045
.55	.8546	1.157	.83	.4364	.5907
.56	.8303	1.124	.84	.4262	.5769
.57	.8073	1.093	.85	.4162	.5633
.58	.7854	1.063	.86	.4061	.5497
.59	.7646	1.035	.87	.3961	.5361
.60	.7447	1.008	.88	.3860	.5225
.61	.7257	.9822	.89	.3759	.5088
.62	.7075	.9576	.90	.3657	.4950
.63	.6900	.9340	.91	.3553	.4809
.64	.6733	.9113	.92	.3446	.4664
.65	.6572	.8896	.93	.3336	.4515
.66	.6417	.8686	.94	.3221	.4360
.67	.6268	.8484	.95	.3099	.4195
.68	.6123	.8288	.96	.2968	.4017
.69	.5984	.8099	.97	.2820	.3817
.70	.5849	.7916	.98	.2646	.3581
			.99	.2410	.3263

TABLE I (Cont'd)

$p_1 = .24$

p_2	$\bar{H}'$	S'	p_2	$\bar{H}'$	S'
.44	1.272	1.801	.72	.5479	.7757
.45	1.217	1.722	.73	.5354	.7581
.46	1.166	1.651	.74	.5233	.7410
.47	1.119	1.585	.75	.5115	.7242
.48	1.077	1.524	.76	.5000	.7079
.49	1.037	1,468	.77	.4888	.6920
.50	1.000	1.416	.78	.4777	.6764
.51	.9657	1.367	.79	.4669	.6611
.52	.9336	1.322	.80	.4563	.6460
.53	.9037	1.279	.81	.4458	.6312
.54	.8756	1.240	.82	.4355	.6166
.55	.8489	1.202	.83	.4254	.6022
.56	.8239	1.166	.84	.4153	.5880
.57	.8002	1.133	.85	.4053	.5738
.58	.7777	1.101	.86	.3953	.5597
.59	.7564	1.071	.87	.3854	.5456
.60	.7360	1.042	.88	.3754	.5315
.61	.7166	1.015	.89	.3654	.5174
.62	.6981	.9883	.90	.3553	.5030
.63	.6803	.9632	.91	.3450	.4885
.64	.6633	.9391	.92	.3345	.4736
.65	.6470	.9161	.93	.3237	.4583
.66	.6313	.8938	.94	.3124	.4423
.67	.6162	.8724	.95	.3004	.4253
.68	.6016	.8518	.96	.2875	.4070
.69	.5875	.8318	.97	.2730	.3865
.70	.5739	.8125	.98	.2559	.3623
.71	.5607	.7938	.99	.2329	.3298

TABLE I (Cont'd)

$p_1 = .25$

p_2	$\bar{H}'$	S'	p_2	$\bar{H}'$	S'
[illegible]	1.229	1.822	.73	.5240	.7768
[illegible]	1.175	1.742	.74	.5118	.7588
[illegible]	1.126	1.669	.75	.5000	.7413
[illegible]	1.080	1.602	.76	.4885	.7242
[illegible]	1.039	1.540	.77	.4773	.7076
.50	1.000	1.483	.78	.4662	.6912
.51	.9641	1.429	.79	.4555	.6753
.52	.9307	1.380	.80	.4449	.6596
.53	.8996	1.334	.81	.4345	.6442
.54	.8704	1.290	.82	.4242	.6290
.55	.8429	1.250	.83	.4142	.6141
.56	.8171	1.211	.84	.4041	.5992
.57	.7927	1.175	.85	.3942	.5845
.58	.7696	1.141	.86	.3844	.5699
.59	.7478	1.109	.87	.3745	.5553
.60	.7270	1.078	.88	.3647	.5407
.61	.7072	1.048	.89	.3548	.5260
.62	.6883	1.020	.90	.3448	.5112
.63	.6702	.9936	.91	.3347	.4962
.64	.6530	.9681	.92	.3243	.4809
.65	.6364	.9436	.93	.3137	.4651
.66	.6205	.9200	.94	.3026	.4486
.67	.6053	.8973	.95	.2908	.4311
.68	.5905	.8755	.96	.2781	.4123
.69	.5763	.8544	.97	.2640	.3913
.70	.5626	.8341	.98	.2472	.3665
.71	.5493	.8144	.99	.2248	.3332
.72	.5365	.7954			

TABLE I (Cont'd)

$p_1 = .26$

p_2	$\overline{H}'$	S'	p_2	$\overline{H}'$	S'
.46	1.184	1.842	.74	.5000	.7772
.47	1.133	1.761	.75	.4882	.7588
.48	1.085	1.686	.76	.4767	.7410
.49	1.041	1.618	.77	.4655	.7235
.50	1.000	1.554	.78	.4545	.7065
.51	.9624	1.496	.79	.4437	.6898
.52	.9276	1.442	.80	.4332	.6734
.53	.8952	1.392	.81	.4229	.6574
.54	.8650	1.345	.82	.4127	.6416
.55	.8365	1.300	.83	.4027	.6260
.56	.8099	1.259	.84	.3928	.6106
.57	.7848	1.220	.85	.3830	.5953
.58	.7611	1.183	.86	.3732	.5802
.59	.7387	1.148	.87	.3635	.5651
.60	.7175	1.115	.88	.3538	.5500
.61	.6973	1.084	.89	.3440	.5348
.62	.6780	1.054	.90	.3342	.5195
.63	.6597	1.025	.91	.3242	.5040
.64	.6421	.9982	.92	.3140	.4882
.65	.6254	.9722	.93	.3036	.4719
.66	.6093	.9471	.94	.2927	.4549
.67	.5939	.9232	.95	.2811	.4370
.68	.5790	.9001	.96	.2687	.4177
.69	.5647	.8778	.97	.2549	.3962
.70	.5509	.8564	.98	.2385	.3708
.71	.5376	.8356	.99	.2166	.3367
.72	.5247	.8156			
.73	.5121	.7961			

TABLE I (Cont'd)

$p_1 = .27$

p_2	H'	S'	p_2	$\bar{H}'$	S'
.47	1.140	1.860	.75	.4760	.7768
.48	1.089	1.777	.76	.4646	.7581
.49	1.043	1.702	.77	.4534	.7399
.50	1.000	1.632	.78	.4425	.7220
.51	.9607	1.568	.79	.4318	.7046
.52	.9243	1.508	.80	.4213	.6876
.53	.8906	1.453	.81	.4111	.6708
.54	.8592	1.402	.82	.4010	.6544
55	.8298	1.354	.83	.3911	.6382
56	.8023	1.309	.84	.3813	.6222
57	.7765	1.267	.85	.3716	.6064
58	.7522	1.227	.86	.3619	.5906
59	.7293	1.190	.87	.3523	.5750
60	.7075	1.155	.88	.3428	.5593
61	.6869	1.121	.89	.3332	.5437
62	.6673	1.089	.90	.3235	.5279
63	.6487	1.059	.91	.3137	.5119
64	.6309	1.030	.92	.3037	.4956
65	.6140	1.002	.93	.2934	.4788
66	.5977	.9753	.94	.2827	.4613
67	.5821	.9499	.95	.2714	.4429
68	.5671	.9255	.96	.2593	.4231
69	.5527	.9020	.97	.2457	.4010
70	.5389	.8794	.98	.2298	.3750
71	.5255	.8572	.99	.2085	.3402
72	.5125	.8364			
73	.5000	.8159			
74	.4879	.7961			

TABLE I (Cont'd)

$p_1 = .28$

p_2	$\bar{H}'$	S'
.48	1.094	1.878
.49	1.045	1.793
.50	1.000	1.716
.51	.9587	1.645
.52	.9207	1.580
.53	.8856	1.520
.54	.8530	1.464
.55	.8226	1.411
.56	.7942	1.363
.57	.7677	1.317
.58	.7427	1.274
.59	.7192	1.234
.60	.6970	1.196
.61	.6760	1.160
.62	.6561	1.126
.63	.6371	1.093
.64	.6191	1.062
.65	.6020	1.033
.66	.5856	1.005
.67	.5699	.9778
.68	.5548	.9519
.69	.5403	.9270
.70	.5264	.9032
.71	.5129	.8801
.72	.5000	.8579
.73	.4875	.8364
.74	.4753	.8156
.75	.4635	.7954
.76	.4521	.7757
.77	.4410	.7567
.78	.4301	.7380
.79	.4195	.7198
.80	.4092	.7020
.81	.3990	.6846
.82	.3890	.6675
.83	.3792	.6506
.84	.3695	.6340
.85	.3599	.6176
.86	.3504	.6013
.87	.3410	.5851
.88	.3316	.5689
.89	.3221	.5527
.90	.3126	.5364
.91	.3030	.5199
.92	.2932	.5030
.93	.2831	.4858
.94	.2726	.4678
.95	.2616	.4489
.96	.2496	.4285
.97	.2366	.4059
.98	.2211	.3793
.99	.2003	.3437

TABLE I (Cont'd)

$p_1 = .29$

p_2	$\bar{H}'$	S'	p_2	$\bar{H}'$	S'
.49	1.048	1.893	.77	.4283	.7739
.50	1.000	1.807	.78	.4175	.7544
.51	.9566	1.729	.79	.4070	.7354
.52	.9168	1.657	.80	.3967	.7168
.53	.8802	1.591	.81	.3866	.6987
.54	.8464	1.530	.82	.3768	.6808
.55	.8149	1.473	.83	.3671	.6633
.56	.7856	1.420	.84	.3575	.6460
.57	.7583	1.370	.85	.3481	.6290
.58	.7327	1.324	.86	.3387	.6121
.59	.7087	1.281	.87	.3294	.5953
.60	.6860	1.240	.88	.3202	.5786
.61	.6646	1.201	.89	.3109	.5618
.62	.6443	1.164	.90	.3016	.5450
.63	.6251	1.130	.91	.2922	.5279
.64	.6069	1.097	.92	.2826	.5106
.65	.5895	1.065	.93	.2727	.4928
.66	.5729	1.035	.94	.2625	.4743
.67	.5571	1.007	.95	.2517	.4549
.68	.5420	.9793	.96	.2402	.4340
.69	.5274	.9530	.97	.2273	.4108
.70	.5135	.9278	.98	.2123	.3836
.71	.5000	.9035	.99	.1922	.3473
.72	.4871	.8801			
.73	.4745	.8575			
.74	.4624	.8356			
.75	.4507	.8144			
.76	.4393	.7938			

TABLE I (Cont'd)

$p_1 = .30$

p_2	$\bar{H}'$	S'
.50	1.000	1.907
.51	.9543	1.820
.52	.9126	1.740
.53	.8744	1.668
.54	.8393	1.601
.55	.8066	1.538
.56	.7764	1.480
.57	.7483	1.427
.58	.7220	1.377
.59	.6974	1.330
.60	.6743	1.286
.61	.6525	1.244
.62	.6322	1.205
.63	.6124	1.168
.64	.5942	1.133
.65	.5764	1.099
.66	.5597	1.067
.67	.5438	1.037
.68	.5286	1.008
.69	.5140	.9801
.70	.5000	.9535
.71	.4865	.9278
.72	.4736	.9032
.73	.4611	.8794
.74	.4491	.8564
.75	.4374	.8341
.76	.4261	.8125
.77	.4151	.7916
.78	.4044	.7713
.79	.3940	.7514
.80	.3839	.7321
.81	.3740	.7131
.82	.3642	.6945
.83	.3547	.6763
.84	.3452	.6586
.85	.3360	.6407
.86	.3268	.6232
.87	.3177	.6058
.88	.3086	.5884
.89	.2995	.5711
.90	.2904	.5537
.91	.2811	.5361
.92	.2718	.5183
.93	.2623	.5000
.94	.2522	.4810
.95	.2417	.4610
.96	.2305	.4395
.97	.2180	.4158
.98	.2034	.3879
.99	.1840	.3508

TABLE I (Cont'd)

$p_1 = .31$

p_2	$\bar{H}'$	S'	p_2	$\bar{H}'$	S'
.51	1.000	1.919	.75	.4237	.8544
.52	.9081	1.831	.76	.4125	.8318
.53	.8682	1.751	.77	.4016	.8099
.54	.8316	1.677	.78	.3911	.7886
.55	.7978	1.609	.79	.3808	.7679
.56	.7666	1.546	.80	.3708	.7477
.57	.7376	1.487	.81	.3610	.7280
.58	.7107	1.433	.82	.3514	.7086
.59	.6855	1.375	.83	.3420	.6896
.60	.6606	1.335	.84	.3327	.6709
.61	.6397	1.290	.85	.3236	.6526
.62	.6188	1.248	.86	.3146	.6344
.63	.5991	1.208	.87	.3057	.6164
.64	.5804	1.170	.88	.2968	.5985
.65	.5628	1.135	.89	.2879	.5806
.66	.5459	1.101	.90	.2790	.5626
.67	.5299	1.069	.91	.2700	.5445
.68	.5146	1.038	.92	.2609	.5260
.69	.5000	1.008	.93	.2515	.5072
.70	.4860	.9801	.94	.2418	.4876
.71	.4726	.9530	.95	.2317	.4672
.72	.4597	.9270	.96	.2207	.4451
.73	.4473	.9020	.97	.2087	.4218
.74	.4353	.8778	.98	.1945	.3922
			.99	.1757	.3543

$p_1 = .32$

.52	.9037	1.931	.60	.6487	1.387
.53	.8613	1.842	.61	.6261	1.339
.54	.8233	1.760	.62	.6049	1.293
.55	.7882	1.685	.63	.5849	1.251
.56	.7559	1.616	.64	.5661	1.210
.57	.7261	1.553	.65	.5483	1.172
.58	.6985	1.493	.66	.5314	1.136
.59	.6728	1.438	.67	.5153	1.102

TABLE I (Cont'd)

$p_1 = .32$ (Cont'd)

p_2	$\bar{H}'$	S'	p_2	$\bar{H}'$	S'
.68	.5000	1.069	.84	.3199	.6839
.69	.4854	1.038	.85	.3110	.6648
.70	.4714	1.008	.86	.3021	.6460
.71	.4580	.9793	.87	.2934	.6273
.72	.4452	.9519	.88	.2847	.6088
.73	.4329	.9255	.89	.2761	.5902
.74	.4210	.9001	.90	.2674	.5717
.75	.4095	.8755	.91	.2586	.5529
.76	.3984	.8518	.92	.2497	.5340
.77	.3877	.8288	.93	.2406	.5145
.78	.3772	.8065	.94	.2312	.4943
.79	.3671	.7849	.95	.2214	.4734
.80	.3572	.7638	.96	.2108	.4507
.81	.3476	.7432	.97	.1991	.4258
.82	.3382	.7230	.98	.1855	.3966
.83	.3289	.7033	.99	.1674	.3579

$p_1 = .33$

.53	.8538	1.941	.69	.4701	1.069
.54	.8142	1.851	.70	.4562	1.037
.55	.7778	1.768	.71	.4429	1.007
.56	.7445	1.692	.72	.4301	.9778
.57	.7138	1.623	.73	.4179	.9499
.58	.6854	1.558	.74	.4061	.9232
.59	.6591	1.498	.75	.3947	.8973
.60	.6346	1.443	.76	.3838	.8724
.61	.6117	1.390	.77	.3732	.8489
.62	.5902	1.316	.78	.3629	.8250
.63	.5700	1.297	.79	.3530	.8024
.64	.5510	1.253	.80	.3433	.7803
.65	.5331	1.212	.81	.3338	.7588
.66	.5161	1.173	.82	.3246	.7378
.67	.5000	1.137	.83	.3155	.7173
.68	.4847	1.102	.84	.3067	.6972

TABLE I (Cont'd)

$p_1 = .33$ (Cont'd)

	$\bar{H}'$	S'	p_2	$\bar{H}'$	S'
.85	.2980	.6774	.93	.2296	.5222
.86	.2894	.6578	.94	.2205	.5013
.87	.2809	.6384	.95	.2110	.4797
.88	.2724	.6192	.96	.2008	.4565
.89	.2640	.6001	.97	.1896	.4309
.90	.2555	.5809	.98	.1764	.4010
.91	.2470	.5616	.99	.1590	.3615
.92	.2384	.5420			

$p_1 = .34$

.54	.8043	1.950	.78	.3482	.8441
.55	.7664	1.858	.79	.3384	.8204
.56	.7320	1.775	.80	.3289	.7974
.57	.7005	1.698	.81	.3197	.7750
.58	.6714	1.628	.82	.3106	.7531
.59	.6445	1.563	.83	.3018	.7317
.60	.6196	1.502	.84	.2932	.7107
.61	.5963	1.446	.85	.2847	.6902
.62	.5745	1.393	.86	.2763	.6699
.63	.5541	1.343	.87	.2680	.6498
.64	.5350	1.297	.88	.2598	.6299
.65	.5170	1.253	.89	.2517	.6101
.66	.5000	1.212	.90	.2435	.5903
.67	.4839	1.173	.91	.2353	.5704
.68	.4686	1.136	.92	.2269	.5502
.69	.4541	1.101	.93	.2185	.5296
)	.4403	1.067	.94	.2097	.5083
	.4271	1.035	.95	.2005	.4861
	.4144	1.005	.96	.1907	.4623
	.4023	.9753	.97	.1799	.4361
.74	.3907	.9471	.98	.1673	.4055
.75	.3795	.9200	.99	.1506	.3651
.76	.3687	.8938			
.77	.3583	.8686			

TABLE I (Cont'd)

$p_1 = .35$

p_2	$\bar{H}'$	S'	p_2	$\bar{H}'$	S'
.55	.7540	1.957	.79	.3233	.8391
.56	.7184	1.865	.80	.3140	.8150
.57	.6859	1.780	.81	.3050	.7916
.58	.6561	1.703	.82	.2962	.7688
.59	.6287	1.632	.83	.2876	.7465
.60	.6033	1.566	.84	.2792	.7247
.61	.5797	1.505	.85	.2710	.7033
.62	.5577	1.448	.86	.2628	.6823
.63	.5372	1.394	.87	.2548	.6615
.64	.5180	1.344	.88	.2469	.6409
.65	.5000	1.298	.89	.2390	.6204
.66	.4829	1.253	.90	.2311	.5999
.67	.4669	1.212	.91	.2232	.5793
.68	.4516	1.172	.92	.2152	.5585
.69	.4372	1.135	.93	.2070	.5373
.70	.4235	1.099	.94	.1985	.5154
.71	.4104	1.065	.95	.1897	.4925
.72	.3979	1.033	.96	.1803	.4681
.73	.3860	1.002	.97	.1700	.4412
.74	.3745	.9721	.98	.1579	.4100
.75	.3635	.9435	.99	.1420	.3687
.76	.3529	.9160			
.77	.3427	.8896			
.78	.3328	.8639			

$p_1 = .36$

.56	.7036	1.963	.64	.5000	1.395
.57	.6702	1.870	.65	.4819	1.344
.58	.6397	1.784	.66	.4649	1.297
.59	.6117	1.706	.67	.4490	1.253
.60	.5859	1.635	.68	.4339	1.210
.61	.5620	1.568	.69	.4195	1.170
.62	.5399	1.506	.70	.4060	1.133
.63	.5192	1.448	.71	.3931	1.097

TABLE I (Cont'd)

$p_1 = .36$ (Cont'd)

			p_2	$\bar{H}'$	S'
		1.062	.88	.2337	.6521
		1.030	.89	.2261	.6309
		.9982	.90	.2185	.6097
		.9680	.91	.2109	.5884
	66	.9391	.92	.2032	.5670
	3267	.9113	.93	.1954	.5451
.78	.3170	.8844	.94	.1873	.5226
.79	.3077	.8584	.95	.1789	.4991
.80	.2987	.8332	.96	.1699	.4741
.81	.2899	.8087	.97	.1600	.4465
.82	.2814	.7849	.98	.1486	.4145
.83	.2731	.7617	.99	.1335	.3724
.84	.2649	.7390			
.85	.2570	.7168			
.86	.2491	.6950			
.87	.2414	.6734			

$p_1 = .37$

.57	.6529	1.967	.73	.3513	1.059
.58	.6217	1.873	.74	.3403	1.025
.59	.5933	1.788	.75	.3297	.9936
.60	.5671	1.709	.76	.3196	.9632
.61	.5430	1.636	.77	.3099	.9339
.62	.5207	1.569	.78	.3006	.9057
.63	.5000	1.506	.79	.2915	.8785
.64	.4807	1.448	.80	.2828	.8521
.65	.4627	1.394	.81	.2743	.8265
.66	.4458	1.343	.82	.2660	.8017
.67	.4300	1.296	.83	.2580	.7775
.68	.4150	1.251	.84	.2502	.7539
.69	.4009	1.208	.85	.2425	.7308
.70	.3875	1.168	.86	.2350	.7081
.71	.3749	1.130	.87	.2275	.6857
.72	.3628	1.093	.88	.2202	.6636

TABLE I (Cont'd)

$p_1 = .37$ (Cont'd)

p_2	$\bar{H}'$	S'
.89	.2129	.6416
.90	.2057	.6197
.91	.1984	.5978
.92	.1910	.5757
.93	.1836	.5531
.94	.1759	.5300
.95	.1678	.5058
.96	.1593	.4801

p_2	$\bar{H}'$	S'
.97	.1499	.4519
.98	.1391	.4191
.99	.1260	.3797

$p_1 = .38$

p_2	$\bar{H}'$	S'
.58	.6020	1.971
.59	.5731	1.876
.60	.5467	1.790
.61	.5224	1.710
.62	.5000	1.637
.63	.4792	1.569
.64	.4600	1.506
.65	.4422	1.448
.66	.4254	1.393
.67	.4098	1.342
.68	.3951	1.293
.69	.3812	1.248
.70	.3681	1.205
.71	.3556	1.164
.72	.3439	1.126
.73	.3327	1.089
.74	.3219	1.054
.75	.3117	1.020
.76	.3019	.9883
.77	.2925	.9575
.78	.2834	.9279
.79	.2747	.8993
.80	.2663	.8717
.81	.2581	.8450

p_2	$\bar{H}'$	S'
.82	.2502	
.83	.2425	
.84	.2350	.7696
.85	.2276	.7452
.86	.2204	.7216
.87	.2133	.6983
.88	.2063	.6754
.89	.1994	.6527
.90	.1924	.6300
.91	.1855	.6074
.92	.1786	.5849
.93	.1715	.5613
.94	.1642	.5375
.95	.1566	.5127
.96	.1485	.4863
.97	.1397	.4573
.98	.1294	.4238
.99	.1160	.3799

LE I (Cont'd)

$p_1 = .39$

		S'	p_2	$\bar{H}'$	S'
		1.973	.79	.2572	.9210
	-44	1.878	.80	.2491	.8921
	.5000	1.790	.81	.2413	.8641
	.4775	1.710	.82	.2337	.8370
.63	.4569	1.636	.83	.2264	.8107
.64	.4379	1.568	.84	.2192	.7850
.65	.4202	1.505	.85	.2122	.7600
.66	.4037	1.446	.86	.2054	.7355
.67	.3883	1.390	.87	.1986	.7113
.68	.3738	1.339	.88	.1920	.6876
.69	.3602	1.290	.89	.1854	.6640
.70	.3475	1.244	.90	.1789	.6406
.71	.3354	1.201	.91	.1723	.6172
.72	.3239	1.160	.92	.1658	.5936
.73	.3130	1.121	.93	.1591	.5697
.74	.3027	1.084	.94	.1522	.5452
.75	.2928	1.048	.95	.1451	.5196
.76	.2833	1.015	.96	.1375	.4926
.77	.2743	.9822	.97	.1292	.4629
.78	.2656	.9510	.98	.1197	.4286
			.99	.1071	.3837

$p_1 = .40$

.60	.5000	1.974	.72	.3029	1.196
.61	.4755	1.878	.73	.2924	1.155
.62	.4532	1.790	.74	.2825	1.115
.63	.4328	1.709	.75	.2730	1.078
.64	.4140	1.635	.76	.2639	1.042
.65	.3966	1.566	.77	.2553	1.008
.66	.3804	1.502	.78	.2470	.9751
.67	.3654	1.443	.79	.2390	.9436
.68	.3513	1.387	.80	.2313	.9133
69	.3380	1.335	.81	.2239	.8840
70	.3257	1.286	.82	.2167	.8556
71	.3139	1.240	.83	.2097	.8281

TABLE I (Cont'd)

$p_1 = .40$ (Cont'd)

p_2	$\bar{H}'$	S'	p_2	$\bar{H}'$	S'
.84	.2029	.8014	.92	.1527	.6029
.85	.1964	.7753	.93	.1464	.5783
.86	.1899	.7498	.94	.1400	.5530
.87	.1835	.7247	.95	.1334	.5268
.88	.1773	.7001	.96	.1263	.4990
.89	.1711	.6757	.97	.1186	.4685
.90	.1650	.6515	.98	.1097	.4334
.91	.1588	.6273	.99	.0981	.3876

$p_1 = .41$

.61	.4489	1.973	.81	.2058	.9046
.62	.4268	1.876	.82	.1990	.8750
.63	.4067	1.788	.83	.1925	.8462
.64	.3882	1.706	.84	.1862	.8183
.65	.3712	1.632	.85	.1800	.7912
.66	.3555	1.562	.86	.1740	.7646
.67	.3409	1.498	.87	.1680	.7386
.68	.3272	1.438	.88	.1622	.7130
.69	.3145	1.382	.89	.1565	.6878
.70	.3026	1.330	.90	.1508	.6626
.71	.2913	1.280	.91	.1451	.6376
.72	.2808	1.234	.92	.1393	.6125
.73	.2707	1.190	.93	.1336	.5871
.74	.2612	1.148	.94	.1276	.5611
.75	.2522	1.109	.95	.1215	.5341
.76	.2436	1.071	.96	.1150	.5055
.77	.2354	1.035	.97	.1079	.4743
.78	.2276	1.000	.98	.0997	.4384
.79	.2200	.9672	.99	.0891	.3916
.80	.2128	.9354			

TABLE I (Cont'd)

$p_1 = .42$

p_2	$\bar{H}'$	S'	p_2	H'	S'
.62	.3979	1.971	.82	.1807	.8950
.63	.3782	1.873	.83	.1746	.8650
.64	.3603	1.784	.84	.1688	.8358
.65	.3438	1.703	.85	.1630	.8076
.66	.3286	1.628	.86	.1575	.7799
.67	.3146	1.558	.87	.1520	.7528
.68	.3015	1.493	.88	.1466	.7263
.69	.2893	1.433	.89	.1413	.7001
.70	.2780	1.377	.90	.1361	.6741
.71	.2673	1.324	.91	.1309	.6482
72	.2573	1.274	.92	.1257	.6227
-	.2478	1.227	.93	.1203	.5961
	.2389	1.183	.94	.1149	.5692
	.2304	1.141	.95	.1093	.5415
	.2223	1.101	.96	.1034	.5121
	.2146	1.063	.97	.0969	.4801
	.2073	1.027	.98	.0895	.4433
	.2002	.9918	.99	.0799	.3955
	.1935	.9583			
	.1870	.9261			

$p_1 = .43$

	.3470	1.967	.75	.2073	1.175
+	.3298	1.870	.76	.1998	1.133
.65	.3140	1.780	.77	.1927	1.093
.66	.2995	1.698	.78	.1860	1.054
.67	.2862	1.623	.79	.1795	1.018
.68	.2739	1.553	.80	.1733	.9823
.69	.2624	1.487	.81	.1673	.9485
.70	.2517	1.427	.82	.1616	.9159
.71	.2417	1.370	.83	.1560	.8845
.72	.2323	1.317	.84	.1507	.8540
.73	.2235	1.267	.85	.1454	.8245
.74	.2152	1.220	.86	.1404	.7957

TABLE I (Cont'd)

$p_1 = .43$ (Cont'd)

p_2	$\bar{H}'$	S'	p_2	$\bar{H}'$	S'
.87	.1354	.7676	.95	.0969	.5491
.88	.1305	.7400	.96	.0915	.5189
.89	.1257	.7128	.97	.0858	.4861
.90	.1210	.6859	.98	.0791	.4484
.91	.1163	.6591	.99	.0705	.3996
.92	.1115	.6323			
.93	.1068	.6053			
.94	.1019	.5776			

$p_1 = .44$

.64	.2964	1.963	.84	
.65	.2816	1.865	.85	
.66	.2680	1.775	.86	
.67	.2555	1.692	.87	
.68	.2441	1.616	.88	
.69	.2334	1.546	.89	
.70	.2236	1.481	.90	
.71	.2144	1.420	.91	
.72	.2058	1.363	.92	
.73	.1977	1.309		
.74	.1901	1.259		
.75	.1829	1.211		
.76	.1761	1.166		
.77	.1697	1.124		
.78	.1636	1.083		
.79	.1577	1.044		
.80	.1521	1.007		
.81	.1468	.9719		
.82	.1416	.9377		
.83	.1366	.9048		

$p_1 = .45$

		S'	p_2	$\bar{H}'$	S'
	)	1.957	.85	.1081	.8605
	.2255	1.858	.86	.1042	.8291
	.2222	1.768	.87	.1003	.7986
	.2118	1.685	.88	.0966	.7688
.69	.2022	1.609	.89	.0929	.7395
.70	.1933	1.538	.90	.0893	.7105
.71	.1850	1.473	.91	.0857	.6818
.72	.1774	1.411	.92	.0821	.6532
.73	.1702	1.354	.93	.0784	.6244
.74	.1634	1.300	.94	.0747	.5950
.75	.1570	1.250	.95	.0709	.5647
.76	.1510	1.202	.96	.0669	.5329
.77	.1454	1.157	.97	.0626	.4983
.78	.1399	1.114	.98	.0575	.4580
.79	.1348	1.073	.99	.0512	.4078
.80	.1299	1.034			
.81	.1252	.9964			
.82	.1207	.9605			
.83	.1163	.9260			
.84	.1122	.8926			

$p_1 = .46$

.66	.1957	1.950	.78	.1150	1.146
.67	.1858	1.851	.79	.1107	1.103
.68	.1767	1.760	.80	.1065	1.062
.69	.1683	1.677	.81	.1026	1.022
.70	.1606	1.601	.82	.0988	.9844
.71	.1535	1.530	.83	.0952	.9482
.72	.1469	1.464	.84	.0916	.9133
.73	.1407	1.402	.85	.0883	.8796
.74	.1350	1.345	.86	.0850	.8469
.75	.1295	1.290	.87	.0818	.8151
.76	.1244	1.240	.88	.0787	.7840
.77	.1196	1.192	.89	.0756	.7536

TABLE I (Cont'd)

$p_1 = .46$ (Cont'd)

p_2	$\bar{H}'$	S'	p_2	$\bar{H}'$	
.90	.0726	.7235	.94	.0606	.6041
.91	.0696	.6938	.95	.0575	.5729
.92	.0666	.6642	.96	.0542	.5402
.93	.0636	.6344	.97	.0506	.5047
			.98	.0466	.4642
			.99	.0413	.4120

$p_1 = .47$

.67	.1462	1.941	.83	.0731	.9713
.68	.1387	1.842	.84	.0703	.9347
.69	.1318	1.751	.85	.0677	.8995
.70	.1256	1.668	.86	.0651	.8653
.71	.1198	1.591	.87	.0626	.8321
.72	.1144	1.520	.88	.0602	.7998
.73	.1094	1.453	.89	.0578	.7682
.74	.1047	1.392	.90	.0554	.7369
.75	.1004	1.334	.91	.0531	.7061
.76	.0963	1.279	.92	.0508	.6754
.77	.0924	1.228	.93	.0485	.6447
.78	.0888	1.180	.94	.0461	.6134
.79	.0854	1.134	.95	.0437	.5813
.80	.0821	1.091	.96	.0412	.5476
.81	.0789	1.049	.97	.0384	.5112
.82	.0760	1.009	.98	.0354	.4697
			.99	.0314	.4163

$p_1 = .48$

.68	.0969	1.931	.76	.0664	1.322
.69	.0919	1.831	.77	.0636	1.267
.70	.0874	1.740	.78	.0610	1.216
.71	.0832	1.657	.79	.0586	1.167
.72	.0730	1.580	.80	.0563	1.121
.73	.0757	1.508	.81	.0541	1.077
.74	.0724	1.442	.82	.0520	1.036
.75	.0693	1.380	.83	.0500	.9956

TABLE I (Cont'd)

$p_1 = .48$ (Cont'd)

p_2	$\bar{H}'$	S'	p_2	$\bar{H}'$	S'
.86	.0481	.9572	.92	.0345	.6871
.87	.0462	.9203	.93	.0329	.6553
.88	.0444	.8846	.94	.0313	.6231
.89	.0427	.8499	.95	.0296	.5899
.90	.0410	.8162	.96	.0279	.5553
.91	.0393	.7833	.97	.0260	.5179
	.0377	.7509	.98	.0239	.4753
	.0361	.7189	.99	.0211	.4208

$p_1 = .49$

p_2	$\bar{H}'$	S'	p_2	$\bar{H}'$	S'
.69	.0482	1.919	.85	.0237	.9421
.70	.0457	1.820	.86	.0227	.9046
.71	.0434	1.729	.87	.0218	.8684
.72	.0430	1.645	.88	.0209	.8333
.73	.0394	1.568	.89	.0201	.7990
.74	.0376	1.496	.90	.0192	.7653
.75	.0359	1.429	.91	.0184	.7321
.76	.0343	1.367	.92	.0176	.6992
.77	.0329	1.309	.93	.0167	.6663
.78	.0315	1.254	.94	.0159	.6330
.79	.0302	1.203	.95	.0150	.5988
.80	.0290	1.154	.96	.0141	.5631
.81	.0278	1.107	.97	.0132	.5247
.82	.0267	1.063	.98	.0121	.4810
.83	.0256	1.021	.99	.0107	.4253
.84	.0246	.9808			

$p_1 = .50$

p_2	$\bar{H}'$	S'	p_2	$\bar{H}'$	S'
.70	.000	1.907	.78	.000	1.295
.71	.000	1.807	.79	.000	1.240
.72	.000	1.716	.80	.000	1.188
.73	.000	1.632	.81	.000	1.139
.74	.000	1.554	.82	.000	1.092
.75	.000	1.483	.83	.000	1.048
.76	.000	1.416	.84	.000	1.005
.77	.000	1.354	.85	.000	.9649

TABLE I (Cont'd)

$p_1 = .50$ (Cont'd)

p_2	$\bar{H}'$	S'	p_2	$\bar{H}'$	S'
.86	.000	.9257	.94	.000	.6432
.87	.000	.8878	.95	.000	.6079
.88	.000	.8511	.96	.000	.5712
.89	.000	.8153	.97	.000	.5317
.90	.000	.7803	.98	.000	.4869
.91	.000	.7458	.99	.000	.4299
.92	.000	.7117			
.93	.000	.6776			

$p_1 = .51$ (All $\bar{H}'$ values are negative)

.71	.0475	1.893	.87	.0228	.9080
.72	.0450	1.793	.88	.0218	.8696
.73	.0427	1.701	.89	.0209	.8324
.74	.0406	1.618	.90	.0200	.7959
.75	.0387	1.540	.91	.0191	.7601
.76	.0368	1.468	.92	.0182	.7246
.77	.0352	1.401	.93	.0173	.6893
.78	.0336	1.339	.94	.0164	.6537
.79	.0321	1.280	.95	.0155	.6174
.80	.0307	1.225	.96	.0145	.5795
.81	.0294	1.173	.97	.0135	.5389
.82	.0282	1.123	.98	.0124	.4930
.83	.0270	1.076	.99	.0109	.4346
.84	.0259	1.032			
.85	.0249	.9888			
.86	.0239	.9477			

$p_1 = .52$ (All $\bar{H}'$ values are negative)

.72	.0942	1.878	.80	.0634	1.264
.73	.0892	1.777	.81	.0606	1.208
.74	.0846	1.686	.82	.0580	1.156
.75	.0804	1.602	.83	.0555	1.106
.76	.0766	1.524	.84	.0531	1.059
.77	.0729	1.452	.85	.0509	1.016
.78	.0695	1.385	.86	.0487	.9707
.79	.0663	1.322	.87	.0466	.9291

TABLE I (Cont'd)

p_1 = .52 (Cont'd)

p_2	$\bar{H}'$	S'	p_2	$\bar{H}'$	S'
.89	.0446	.8890	.96	.0295	.5880
.90	.0426	.8501	.97	.0274	.5462
.91	.0407	.8120	.98	.0250	.4991
.92	.0388	.7748	.99	.0220	.4393
.93	.0370	.7380			
.94	.0352	.7014			
.95	.0333	.6646			
	.0314	.6270			

p_1 = .53 (All $\bar{H}'$ values are negative)

p_2	$\bar{H}'$	S'	p_2	$\bar{H}'$	S'
.73	.1400	1.860	.89	.0654	.8686
.74	.1325	1.761	.90	.0624	.8289
.75	.1256	1.669	.91	.0595	.7902
.76	.1193	1.585	.92	.0566	.7519
.77	.1134	1.507	.93	.0537	.7140
.78	.1080	1.435	.94	.0508	.6759
.79	.1029	1.368	.95	.0479	.6371
.80	.0982	1.305	.96	.0449	.5968
.81	.0938	1.246	.97	.0417	.5538
.82	.0896	1.190	.98	.0380	.5054
.83	.0856	1.114	.99	.0334	.4442
.84	.0819	1.088			
.85	.0783	1.040			
.86	.0749	.9950			
.87	.0716	.9513			
.88	.0684	.9093			

p_1 = .54 (All $\bar{H}'$ values are negative)

p_2	$\bar{H}'$	S'	p_2	$\bar{H}'$	S'
.74	.1849	1.842	.82	.1231	1.227
.75	.1748	1.742	.83	.1175	1.171
.76	.1657	1.650	.84	.1122	1.118
.77	.1572	1.566	.85	.1042	1.038
.78	.1494	1.489	.86	.1024	1.021
.79	.1422	1.416	.87	.0978	.9746
.80	.1354	1.349	.88	.0934	.9305
.81	.1291	1.286	.89	.0891	.8880